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AND THE RECORDING OF

AMERICAN AND OTHER PATENTED INVENTIONS.

OCTOBER, 1834.

Proposed Regulations for Vessels Propelled by Steam.

The following bill was reported by the committee on naval affairs of the Senate of the United States, on the 12th of June last, not with a view to its being acted upon during the late session, which was then drawing to a close, but preparatory to a more enlightened procedure hereafter, and, with this view, we now publish it, and hope that the journals of the day may make it extensively known, and thus afford an opportunity to those who are informed upon the subject, to suggest such ideas as may tend to render the act, when passed, as pefect as possible. Any communications having this object in view, addressed to the Editor, or to the Actuary of the Franklin Institute, will be laid before the Committee of Congress, at the next session, in such a way as shall appear most likely to render them useful.

In giving this notice, the Editor would remark, that it is not intended to invite the communication of any specific plan for preventing explosions, however valuable it may be in the eyes of its inventor, or in itself; such plans may be spread out upon the pages of the Journal, but the legislation of Congress upon the subject, must be of a general character, enforcing the adoption of those precautionary means which are applicable to engines of every description. It will be time enough to adopt the plan of an individual after he shall have carried it into operation to such an extent that the evidence of continued use in nu-

merous and trying cases, shall have left no doubt of its efficiency; an event not likely to be one of early occurrence.

EDITOR.

A BILL

For the Regulation of Vessels propelled in the whole, or in part, by Steam.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be the duty of all owners of steam-boats, or vessels propelled in the whole, or in part, by steam, on or before the first day of October, one thousand eight hundred and thirty-four, to make a new enrolment of the same under the existing laws of the United States, and to take out from the collector or surveyor of the port, as the case may be, where such steam boat, or vessel, is enrolled, a new license, under such conditions as are now imposed by law, and as shall be imposed by this act.

Sec. 2. *And be it further enacted*, That it shall not be lawful for the owner, master, or captain, of any steam-boat, or vessel, propelled in the whole, or in part, by steam, to transport any goods, wares, and merchandise, or passengers, in, or upon, the bays, lakes, rivers, or other navigable waters of the United States, from and after the said first day of October, one thousand eight hundred and thirty-four, without having first obtained from the proper officer, a license under the existing laws, and without having complied with the conditions imposed by this act; and for each and every violation of this section, the owner, or owners, of said steam-boat, or vessel, shall forfeit and pay to the United States, the sum of

Sec. 3. *And be it further enacted*, That it shall be the duty of the President to appoint at such ports on the navigable waters, bays, lakes, and rivers, of the United States, as in his judgment will be most convenient to the owners and masters of steam-boats and vessels propelled in the whole, or in part, by steam, one or more persons of competent skill, to make inspections of such boats and vessels, and of the boilers and machinery employed in the same, whose duty it shall be to make such inspections when called upon for that purpose, and to give to the owner or master of such boat or vessel duplicate certificates of all such inspections, and the said person, so appointed, shall, before entering upon the duties of said appointment, take an oath, before some competent authority, faithfully to perform and discharge the same.

Sec. 4. *And be it further enacted*, That the person who shall be called upon to inspect the hull of any steam-boat, or vessel, under the provisions of this act, shall, after a careful and thorough examination of the same, give to the owner, or master, as the case may be, a certificate, in which shall be stated the age of said boat, or vessel, when, and where, orginally built, and the length of time the same has been running, and his opinion whether the said boat or vessel, be

sound, and fit to be employed for the transportation of passengers or freight; for which service, so performed, on every such boat, or vessel, the said inspector shall be allowed and paid by the owner or master thereof, and before the delivery of said certificate, the sum of dollars, for every boat, or vessel, of less than one hundred tons, and the sum of dollars for every boat, or vessel, of one hundred tons and upwards.

Sec. 5. *And be it further enacted*, That it shall be the duty of the person who shall be called upon to inspect the boilers and machinery of any steam-boat, or vessel, in conformity to the provisions of the third section of this act, carefully, fully, and thoroughly, to inspect and examine the engine and machinery of said boat, or vessel, and to state his opinion of its soundness; and he shall moreover provide himself with a suitable hydraulic pump, and, after examining into the state and condition of the boiler, or boilers, of such boat, or vessel, it shall be his duty to test the strength and soundness of said boiler, or boilers, by applying to the same an hydraulic pressure equal to three times the pressure which the boilers are allowed to carry in steam; and if he shall be of opinion, after such examination and test, that the said machinery and boilers are sound and fit for use, he shall deliver to the owner, or master, of such vessel, or boat, duplicate certificates to that effect, stating therein the age of the said boilers, and the weight, or proportion, of steam which may with safety be carried by said boilers, and which shall in no case exceed one-third part of the weight, or pressure, which said boilers may bear without danger of explosion or injury, one of which certificates it shall be the duty of the said master, or owner, to deliver to the collector, or surveyor of the port, wherever he shall apply for license, or for renewal of license; the other he shall cause to be posted up and kept in some conspicuous part of said boat, or vessel, for the information of the public; and for each and every inspection of the said machinery, and inspection and test of the said boiler, or boilers, the said inspector shall be allowed and paid by the owner, or master, thereof, and before the delivery of the said certificates, the sum of dollars.

Sec. 6. *And be it further enacted*, That it shall be the duty of the owners, or masters, of said boats, or vessels, to cause the inspection provided for by the fourth section of this act to be made at least once in every twelve months; and the examination of the machinery, and the examination and test of the boilers, as provided in the fifth section hereof, to be made at least once in every three months; and to deliver to the collector or surveyor of the port where such boat, or vessel, has been enrolled or licensed, the certificate of such inspection: and on failure thereof, he, or they, shall forfeit the license granted to such boat, or vessel, and be subject to the same penalty as though he had run the said boat, or vessel, without having obtained such license.

Sec. 7. *And be it further enacted*, That whenever the master of any boat, or vessel, or the person, or persons, charged with the navigating said boat, or vessel, which is propelled in the whole, or in part, by steam, shall stop the motion, or headway, of said boat, or vessel;

or when the said boat, or vessel, shall be stopped for the purpose of discharging, or taking in cargo, or passengers; or when "wooding," and the steam in the boiler, or boilers, of such boat, or vessel, shall be equal to one-third part of the ascertained strength of said boiler, or boilers; he, or they, shall keep the engine of said boat, or vessel, in motion sufficient to work the pump, give the necessary supply of water, and to keep the steam down in said boiler, or boilers, to what it is when the said boat, or vessel, is under headway, at the same time lessening the weight on the safety valve, so that it shall give way when the steam in said boiler, or boilers, is equal to of its then ascertained strength, under the penalty of dollars for each and every offence in neglecting or violating the requirements of this section.

Sec. 8. *And be it further enacted*, That it shall be the duty of every master, or pilot, of a steam-boat, or vessel, except those navigating tide water, when descending any river, or stream in the night, when a descending boat shall come within one half mile of an ascending steam-boat, to shut off the steam, and ring the bell, and permit his boat to float upon the current of the river until the ascending boat shall have passed; and the master and owner of the ascending boat shall then assume the responsibility of steering clear of the descending boat, and be liable in damages to the extent of the injury which may be sustained.

Sec. 9. *And be it further enacted*, That it shall be the duty of the master and owner of every steam-boat, or vessel, running in the night, to suspend three lights at least three feet above the deck of said vessel, or boat; one at the bow, another at the stern, and the third at or near the middle of said boat, or vessel, under the penalty of dollars for each and every neglect thereof.

Sec. 10. *And be it further enacted*, That it shall be the duty of the owner and master of every steam-boat, or vessel, engaged in the transportion of freight, or passengers, to provide, and to carry with the said boat, or vessel, upon each and every voyage, or trip, one long-boat, or yawl, for each tons of said boat, or vessel, which long-boat, or yawl, shall be competent to carry at least twelve persons; and for every failure to provide and carry said boats, or yawls, in the proportion aforesaid, the said master and owner shall forfeit and pay dollars: and it shall also be the duty of said master and owner to provide, as a part of the necessary furniture of said boat or vessel, a suction hose, and fire engine and hose, suitable to be worked in said boat in case of fire, and to carry the same in each and every trip and voyage, in good order; and for each and every failure to provide and carry the same as hereinbefore required, said master and owner shall forfeit and pay the sum of dollars.

Sec. 11. *And be it further enacted*, That any owner or master of any steam-boat, or vessel, who shall fail to obtain the certificates of examination hereinbefore provided for in the fourth and fifth sections of this act, shall be barred from the recovery of any claim for freight or insurance that may accrue when without said certificate; and should any loss or damage to property in such case occur, in consequence of

the unsoundness or unfitness for the transportation of freight or passengers of said boat, or vessel, or in consequence of the breaking or bursting of any part of the machinery or boilers, the owner shall be responsible to the full amount of said loss or damage.

Sec. 12. *And be it further enacted*, That the captain, or master, of any boat, or vessel, propelled in the whole or in part by steam, that may not have been examined, and obtained the certificates required by the fifth section of this act, shall, in the event of any loss or damage to property, or injury to persons, occasioned by the breaking of any part of the machinery, or the bursting of the boiler, or boilers, be subject to a fine not less than nor more than dollars, and an imprisonment of not less than , nor more than ; and that, in the event of loss of life being the result of such accident, then said captain, or master, shall be adjudged guilty of manslaughter.

Sec. 13. *And be it further enacted*, That for any accident which may occur from racing, from carrying higher steam than the quantity authorized by the certificate, from running foul of, or into, another boat, from overloading the boat, or from any other cause which it is possible to foresee and avoid, or which may occur from any cause whilst the captain, master, pilot, or engineer, shall be engaged in gambling, or attending to any game of chance or hazard, the owner of such steam-boat, or vessel, shall be subject to the penalties provided for in the eleventh section of this act; and the captain, master, pilot, or engineer, shall be respectively subject to the penalties provided for in the twelfth section hereof.

Sec. 14. *And be it further enacted*, That when gunpowder is shipped on board of any vessel, or boat, propelled in the whole, or in part, by steam, which shall at all times be stowed away at as great a distance as possible from the furnace, a written notification of the fact shall be placed in three conspicuous parts of the boat, or vessel; and in the event of such notification not being so exhibited, then for any loss of property, or life, of which the powder may be deemed the cause, the owner shall be liable to the penalties provided in the eleventh section of this act; and the captain, or master, to the penalties provided in the twelfth.

Sec. 15. *And be it further enacted*, That any person, or persons, who shall ship, or put on board, or cause to be shipped, or put on board, of any steam-boat, or vessel, any gunpowder, without giving notice thereof, at the time of making the shipment, to the master or clerk, of said boat, or vessel, shall be liable to the penalty of dollars, which may be sued for and recovered before any court of competent jurisdiction, by the owner, captain, or clerk, of said vessel, or boat, for his, or her, own use and benefit; and in case of any loss of property in consequence of gunpowder being on board of said vessel, or boat, the shipper that shall have failed to give due notice as hereinbefore required, shall be liable for all losses of property, or damage done thereto, or for any injury done to any person, or to their families; and in case of the loss of the life of any individual on board in consequence of gunpowder being on board, the person, or persons,

who shall have shipped the same without giving due notice thereof, shall, on conviction thereof, be adjudged guilty of manslaughter, and punished accordingly.

Sec. 16. *And be it further enacted*, That it shall be the duty of the person who shall be called upon to inspect the boilers and machinery of any steam boat, or vessel, under the third and fifth sections of this act, to examine the engineer of said boat, or vessel, for the purpose of ascertaining whether he or they be sufficiently qualified for the duties of his or their stations, and to propound interrogatories which the Secretary of the Treasury shall cause to be prepared and transmitted to the said inspector, which said interrogatories, being satisfactorily answered by the engineer, or engineers, and certificates also being produced of his, or their, regular habits, said inspector shall issue duplicate certificates, or diplomas, one to the engineer, or engineers, of said boat, or vessel, and the other to the captain or owner thereof, which said certificates shall be renewed annually; and the certificate granted to the captain, or owner, of said boat, or vessel, shall be exhibited to the collector, or surveyor, of the port, whenever he shall apply for a license, or a renewal of license; and the inspector shall be allowed and paid by the , for every such examination, the sum of dollars.

Sec. 17. *And be it further enacted*, That for any false certificate, or one given without the thorough examination contemplated by this act, the person who may be appointed to make the examination of the hull of any steam-boat, or vessel, or of the machinery thereof, or of the boilers therein, or of the competency and habits of the engineer, or engineers, of said boat, or vessel, shall be dismissed from office, and fined not less than nor more than dollars, and imprisoned not less than nor more than .

Sec. 18. *And be it further enacted*, That all penalties, fines, and forfeitures, imposed by this act, may be sued for, and recovered in any court of the United States of competent jurisdiction, within the district, or circuit, where the same may have been incurred, in the name of the United States—one half to the use of the informer, and the other half to the use and benefit of the United States.

Notice of a Meteorological Phenomenon on the evening of the 25th of July, 1834, with an explanation by James P. Espy, Esq.

TO THE COMMITTEE ON PUBLICATIONS.

I send you for publication the following communication sent to me by my friend Mr. Walker, with my answer to him on the same subject.

To James P. Espy, Esq.

Dear Sir,—On the evening of the 25th of July, Dr. Thomas M'Euen and myself were in the ground east of the Academy of Na-

tural Sciences, observing the double star γ Andromedæ, which was well defined with a power of sixty; on removing this eyepiece and adjusting the focus, the star could not be seen, its sudden disappearance attracted my attention to the circumstance that a haze was travelling from N.W. to S.E., with great rapidity; its front was well defined, for in its progress a star from being bright was obscured as suddenly as by a common cloud. I mentioned the circumstance to Dr. M'Euen who, with me, observed the progress of the haze through a space of 100°, from 50° N.W. altitude to 30° S.E. in about one minute. At an interval of about four minutes the stars reappeared in the same succession as they had disappeared; and again, after a few minutes, were obscured in a similar manner. This occurrence took place at about half-past eleven o'clock, P. M. The evening was very warm—the meteors, or shooting stars, very numerous, and the deposition of dew on the object glass of the telescope, more abundant and more annoying than I have ever noticed it before. After drying the object glass, in the course of five minutes it would be so covered with dew as to render the stars indistinct, an inconvenience which Dr. M'Euen could only remedy by tying round the end of the tube a piece of white pasteboard, which extended a foot beyond the object glass.

Permit me, Sir, after detailing this occurrence to invite your attention to a similar observation, and to a very philosophical explanation of the same made by Sir John Herschel, and recorded in vol. iii. of the Memoirs of the Astronomical Society, London, p. 50, as follows:—

"I cannot forbear mentioning, though relating to a very different branch of science, (one, however, highly important to astronomers,) a meteorological phenomenon, which has often occurred to my notice, but never in so striking a manner as on the night of the 19th of April last. On that night the sky had continued perfectly cloudless, with not a breath of air stirring, and a dew so copious as to run off the telescope in streams, till about half past two, A. M. I had to take the transit of 25 *Herculis*, as a setting star, which passed at 16 h. 21 m. (per chron.) At 16 h. 8 m. one of Piazzi's stars passed and was taken; after which I continued sweeping, the heavens continuing beautifully clear. About five minutes before the expected passage of 25 *Herculis*, I noticed a dusky cloud-bank in the east; it advanced rapidly. Immediately before the transit, *Arcturus* was completely invisible: while yet in the act of bisecting my star, the edge of the haze was on it, and in less than three minutes from that time had extended to the western horizon, obliterating every star by a thick uniform coating of cloud. All the time the calm remained quite undisturbed. The least supposable rapidity of propagation in this case, is 300 miles an hour, in the direction of the sun's motion, and the cause is obviously the exact attainment of a determinate temperature in the region of the atmosphere, where the cloud formed, either by radiation or by diminution of atmospheric pressure taking

place in succession along the whole zone of the sky, and as it were pursuing the point of the heavens opposed to the sun."*

I am, dear Sir,

Yours truly and respectfully,

S. C. WALKER.

To Sears C. Walker, Esq.,

DEAR SIR,—I have received your communication respecting a meteoric phenomenon which occurred on the evening of the 25th of July. It was undoubtedly a most remarkable and interesting appearance, and produced by the same cause as the one described by Sir John Herschel.

It is probable, therefore, that radiation is not the cause of either, for the haze observed by you did not follow the course of the sun, but rather the opposite.

As to the other cause—cold, caused by diminished pressure and consequent rarefaction of the air, it would undoubtedly produce a haze, or cloud, if the dew point were very near the temperature of the air previous to rarefaction.

But as no cause could then be assigned for the sudden disappearance of the haze, we are compelled to reject this also, more especially as it is mere hypothesis—no observation of the barometer having been made.

As to the velocity of propagation being 300 miles per hour—this depends entirely on the supposition that the haze was at a considerable altitude; but neither is this necessary, nor even likely,—for in both cases the copious deposition of dew shows that the dew-point was at the temperature of the air, and consequently a very little greater velocity of the current of air 200 or 300 feet high, than that at the surface of the ground, (a circumstance which almost always takes place, from the friction which the air experiences below,) might cause a current of slightly lower temperature above, to overlap the one below, when the vapour below, by its own elasticity, would thrust itself up into the refrigerating stratum and be condensed within a few hundred feet of the surface of the earth. Its great angular velocity is thus easily conceived while its absolute motion may be very slow. When a stratum of air a little colder than usual does pass

* "The heat disengaged, or absorbed, by the increase or diminution of pressure from barometrical fluctuations, is an element which meteorologists have not been in the habit of taking much account of. When it is considered, however, that it affects the whole mass of the atmosphere—and that in regions where it can neither be parted with nor restored by any process but that of radiation, it acts with its full effect, which is probably much greater than can appear in experiments made in contact with masses of conducting matter,—there seems reason to believe that it may act a sensible and even a considerable part in the production of various meteorological phenomena. The connection of clouds and rain with a falling barometer, and fair weather and clear sky with a rising, is certainly not imaginary, and is explicable on no other principle. I regret that I took no notes of the height of the barometer at the time of the observation recorded in the text."

HERSCHEL.

over our heads moving faster than the air below, it is certain from theory that the vapour below ought to become thinner by thrusting itself up into the air containing less above, and that such is the fact, I think is proved by the following extract from my meteorological journal, and many others which might be given. On the 16th July, 1830, I witnessed the following most remarkable phenomenon. The weather had been very warm and dry for some days, the dew-point nearly stationary at 74, for I had taken it very frequently, and on the day of the present occurrence, I was sitting in my yard, with the means of taking the dew-point with me, when I perceived it suddenly sink three degrees in a few minutes; and at the same time, I observed a cloud forming immediately over my head, and in a few minutes more, the whole time not half an hour, a gentle shower of rain succeeded, hardly enough to wet the pavement. Immediately after this shower the dew-point rose again to 74 its former elevation; similar phenomena have frequently been observed since, both by me and our mutual friend Professor A. D. Bache.

If I have succeeded in this brief manner, to render myself intelligible I think you will agree with me that this is the true explanation of this curious phenomenon.

I am, yours, very truly,

J. P. Espy.

Rev. Mr. Whewell's Notice in relation to the Science of the Tides, together with directions for Tide Observations.

TO THE COMMITTEE ON PUBLICATIONS.

Gentlemen,—It is no doubt well known to you, and to those of your readers who follow the progress of general science, that the Rev. Mr. Whewell, of Trinity College, Cambridge, is engaged in endeavouring to advance the important, and hitherto, comparatively, neglected, science of the tides, the first results of these investigations being the memoir on, and map of, cotidal lines, contained in the Transactions of the Royal Society of London, for 1833. Through the kindness of a mutual friend, I have received the articles,* also from the pen of Mr. Whewell, on the subject just referred to, which accompany this note, and which I should feel obliged by your inserting in that part of the Journal of the Institute where they will be most likely to meet the eye of any one who may be disposed to contribute good tide observations to the stock which Mr. Whewell is now accumulating, for the further elucidation of his subject. By this publication I shall probably best comply with the wishes expressed by Mr. Whewell. In addition I have only to offer to communicate to that gentleman any observations which may be addressed to me, and in the way which the author may desire.

Very respectfully yours,

Philada. Aug. 26, 1834. A. D. Bache.

* On the present state of the Science of the Tides. Directions for Tide Observations, Nos. 1, 2, and 3.

On the present state of the Science of the Tides. By the Rev. W. Whewell, *Fellow and Tutor of Trinity College, Cambridge.*

The state of our information concerning the tides is at present exciting considerable attention among English mathematicians; and it will probably not be long before we shall be able to announce some decided additions to our knowledge on this subject. A sketch of the present situation of this remarkable branch of science may, therefore, interest the readers of the United Service Journal; the more so, as many of them, especially naval men, may have it in their power to promote our progress by their labours or their influence.

The popular opinion on this subject is, that the true theory of the tides was discovered by Sir Isaac Newton; that he showed this curious though familiar phenomenon to be a result of the attraction exerted by the moon upon the waters of the ocean and upon the earth itself; and that in this way the course of the tides, like the motions of all the bodies of the solar system, was shown to result from one great and pervading law—the universal, mutual attraction of matter. And so far the popular opinion is right; but there is a difference to be noticed with regard to what Newton and the Newtonian philosophy have done in reference to this subject, and to the other consequences of the law of universal gravitation. With regard to the motions of the earth, the moon, and the planets, those motions are not only accounted for, but all the circumstances and quantities of the motions are fully explained—so fully explained that they can be exactly calculated beforehand; and predictions of the future places of all the heavenly bodies can be delivered for any future period, however distant, which predictions are always verified with an accuracy truly remarkable. The power of calculation and prediction which we thus obtain is that which sets the seal of certainty and reality upon the theory, and makes it impossible for any intelligent and unprejudiced person who examines it, not to be entirely convinced of its truth.

Now, with respect to the tides, the case is hitherto very different from this. The tides are *explained* by the theory of gravitation: that is, it can be shown that a motion of the sea of that kind, governed mainly by the moon, would take place. But neither Newton, nor the Newtonians, nor any modern philosophers, have yet explained the amount and course of the tides, at any one place; nor can they calculate beforehand the time at which the tide will take place, and the height to which it will rise, with any pretensions to accuracy. A person, therefore, who should deny the doctrine of universal gravitation, so far as its application to the explanation of the tides, could not be convinced or refuted, as he might be in other cases, by showing the exact accordance of the results of calculations founded on the theory, with measurements obtained by observation. If we take a record of the times and heights of high water for a long period, we are not in a condition to show that they are what they ought to be, the theory being true; whereas, with regard to the astronomical phe-

nomena which flow from gravitation, we can show this in the most complete and satisfactory manner.

It will probably occur to many of our readers that the effect of accidental circumstances upon the time of high water,—for instance, of wind and weather,—and of the form of the shore, when the tide has to enter harbours and rivers,—will account for a great difference between theory and observation, and indeed would lead us to expect such a difference. But difficulties of this kind may be got over almost entirely. If we observe the tides for a long period, the effect of the wind, upon the average, is very slight, or altogether disappears; and the obstacles and modifying causes which arise from the shore and bottom are the same every day; and therefore would not make the course of the tides irregular, though they may make the time and height different from what they would have been without such obstructions. These circumstances, therefore, do not relieve the theorist from the *onus* of showing that the course of the phenomena is in accordance with his assertions. The *mean* result of observations *ought* to agree with the calculated result of theory.

This responsibility, the Newtonian, if he is a fair and philosophical person, will not attempt to evade; but he will not be able to deny that the obligation has not yet been discharged: the agreement in *detail* of tide observations with the consequences of the moon's attraction, has never yet been shown. The present object, therefore, of the cultivators of this subject ought to be, to bring into view this agreement, that is, if there be an agreement; or, if not, to bring into view the disagreement of fact and theory, and to leave the theory to take the consequences in the best way it can. This, accordingly, is what some persons at present are endeavouring to do; and the collection of long series of exact tide observations, made at many various places, is one essential part of this undertaking, to which the readers of this Journal are invited to contribute.

But, in order to make this comparison, we must not only collect many and good observations, but we must also be able to trace the consequences of the theory, under the actual circumstances of the land and sea on the earth's surface; and this is by no means an easy matter. It is, indeed, so far from easy, that it does not appear possible to do it with great exactness at present: for, the form of the shores of the ocean is so complex and varied, that no calculation can apply to it; and the *depth* of the sea, which is an important element in the question, is absolutely unknown. And, even if we knew all these *data*, the mathematical calculation of the motions of fluids has not yet become so perfect and powerful a system, as to enable us to say what would be the result of the moon's attraction, combined with the earth's motion, on such a body of water; so that our comparison is hitherto defective at both ends: we want to compare calculation and observation, and we have not a sufficient command over either to do so.

We are not, however, yet liberated from our responsibility, as philosophers, of bringing theory and fact together. For though we cannot trace *exactly* the results of theory, we can obtain a general notion

of what nature they will be; and we ought to be able to say whether they are of this nature or not. For the purpose of illustrating this, I will point out one view of the tides in which this comparison would be extremely interesting, and might be made without much difficulty, by a combination of efforts of different persons,—I speak of the manner in which the tide is distributed over the surface of the ocean, and the manner in which it moves from one position to another. For this purpose I must refer to the theory, but in a way not too abtruse for general comprehension.

The moon attracts every part of the earth, and those parts the most which are the nearest to her. Thus, the water under the moon, and the centre of the earth, are both attracted by her; but the water is more attracted than the centre, and therefore has a tendency to go away from the centre; which, if the centre and the water were equally attracted, it would not have. The water will, therefore, rise under the moon and form a protuberance: its convexity will rise higher than it would do if the moon did not attract it.

As the water under the moon is nearer the moon than the centre is, and consequently is more attracted, so the water on the opposite side of the earth is further off, and less attracted than the centre; and therefore is left, as it were, by the centre, which it would not be if the water and the centre were equally attracted. There will, therefore, be a protuberance of the water on the side of the earth which is turned from the moon, of just the same kind as that which is under the moon. The magnitude of these protuberances, will depend upon the mass of the moon and its distance; the nearer the attracting body is to the earth, the greater is the *difference* of its attractive power on the centre and the near or opposite side of the earth. These protuberances would be under the moon and directly opposite to her, if the earth were at rest, and if the whole surface were water. Neither of these things is so, and we must consider what difference will arise from an alteration of these conditions.

The earth revolves on its axis and carries the water with it; and the effect of this will be, that the protuberance will no longer be under the moon; it will *lag behind* the moon, if we suppose the moon to revolve round the earth. But if we suppose the ocean to be regularly diffused over the globe, this lagging will be always the same. If a small island exist in such an ocean, the two protuberances, and the lower water between them, will all pass the island in one day, and thus make two high and two low waters at the island; and these high waters will follow the passage of the moon at an interval of time depending on what I have called the *lagging* of the protuberance which forms the high water; and these protuberances would reach from one pole of the earth to the other, and thus bring high water at the same time to all places on the protuberant line. If we suppose, for the sake of simplicity, that the moon is always in the equator, the tide might be considered as a long wave, reaching from pole to pole, and moving round the earth, following the moon steadily and perpetually, and always at the same angular interval.

But it is very clear, that when we suppose the surface of the ocean

to be interrupted by great continents, like those of the Old and the New World, this sort of motion of the waters cannot go on. If we suppose such a tide-wave as I have spoken of to travel across the Pacific, when it reaches the shores of Asia and Australia it must be utterly broken and dispersed among the large islands of that part of the globe, and its progress westward as one wave altogether interrupted. The Atlantic will not receive its tides by such a wave coming into it from the east; and those tides, and the tides of the whole of this part of the world, must take place in some other way.

Now in what way will the tides, considered on this large scale, take place on the earth, occupied as it really is, with land and sea? We may form some notion of the result, by observing the way in which the long swell of the sea travels into a small creek. The large wave extends across the creek, and the part which fills the opening breaks off and travels separately up the creek. In the same manner we may still imagine a tide-wave moving round the earth from the east to the west in the Southern Ocean (for there is there a complete circuit of water;) and we may conceive that this wave turns northward and then travels into the Indian seas, and that another part of it moves northward up the Atlantic, and after running the profile of its swell along the coast of Africa on one side, and of America on the other, brings the tides to our own shores.

The tide in the Atlantic will not, it may be said, depend entirely on the tide in the Southern Ocean, as we have supposed; for the moon would produce a tide in the Atlantic, even if there were no Southern Ocean. This is quite true; but the way in which the tide moves from one place to another will still be in the nature of the motion of a wave, as it was seen to be in the above explanation.

From this being understood and conceded, a very curious and important undertaking is, *to trace the motion of this wave along the various coasts of the ocean, by actually observing at what time, on a given day or days, it is at each place;* that is, in short, by observing the moment of high water at such places. This is what I have above referred to as a possible and interesting way of comparing the observation of the tides with theoretical views; and this is what I have tried and am now trying to induce several persons to assist in doing.

The line which the ridge of the tide-wave occupies at any moment, I have called a *cotidal line*, intending by that term to suggest its nature, namely, that it is the line drawn through all places having high water at the same instant. This line occupies a different position every hour, and a series of cotidal lines drawn on the surface of the globe for each hour of a given day (the day of new or full moon for instance) would exhibit the motion of the wave, just as in a plan of a battle, the successive places of the same battalion marked on the plan show the movements of the body during the engagement.

Some of the information which is required to enable us to cover the whole surface of the ocean with cotidal lines, has been brought together already; and though it is a mere scrap of that which we might wish, and but a small fraction of that which we hope before long to

attain, it has led already to some curious conclusions. We will take two or three by way of specimen.

It appears, for instance, that the wave, the ridge of which is marked by the cotidal lines, does enter into the Atlantic from the south, and throws itself across that ocean, so as to extend from Brazil to the Gold Coast of Africa, bringing the tide to both at nearly the same time. This tide-wave then travels northwards, is much interrupted and disturbed about the Madeira and Cape Verd Islands, and, after washing the shores of Spain, Portugal and France, reaches the British Isles.

The general, or, as we may say, *natural* direction in which the tide-wave travels is from east to west, following the apparent daily motion of the moon. But in consequence of the position of the shores of Africa and America, the direction of this wave changes so, that its progress is *north*, as we have already seen. When it reaches the chops of the Channel, the tide-wave separates, one branch turns again and takes its way *eastward* up the Channel, thus moving opposite to its original direction. This is the branch which brings the tides to all points of the south coast of England as far as Dover, and, as it would seem, through the Straits of Dover to the North Foreland.

Another branch of the same tide travels along the west coast of Ireland and Scotland, and does not bend eastward till it reaches the Shetlands. But when it has thus turned the north point of Scotland, it not only turns to the east, but it afterwards turns to the south, and then travelling downwards, brings the tide to the whole of the east coast of England, as far as the mouth of the Thames. On reaching this opening, the tide again turns *westward*, and thus comes to London, after going through an entire circle in the way of change of direction.

The general direction of the motion of the tide-wave being from east to west, we might expect that, of all places in the world the most likely one for this direction to prevail in, would be the sea to the southward of Cape Horn, where there is an uninterrupted girdle of water round the earth. Yet it appears to be quite certain, from the observations of Captain King, (see his Sailing Directions,) that the tide is later and later as we take points more and more easterly on the south coast of Terra del Fuego; that is, the tide-wave in this part moves from west to east. It may easily turn out that this apparent anomaly prevails only near the shore, and that further out at sea the tide-wave moves in its *proper* direction; but the curious fact just mentioned shows how much caution, and how extended a collection of observations, are requisite, in order that we may draw our cotidal lines with any degree of accuracy.

There is one general rule which appears to hold respecting the positions of the cotidal lines, so far as they have yet been drawn. As we go out of the wide ocean into the narrower seas, these lines are more and more crowded; that is, the motion of the tide-wave is more and more slow. Thus in the Atlantic the velocity of the tide-wave is 600 or 700 miles an hour; in the Indian seas it is probably not a quarter of this. On the south coast of England the tide which

is at the Lizard at half-past four, is at Dover at fifty minutes past ten. This gives six hours and a quarter, nearly, for the tide to travel from the Lizard to Dover, a distance of about 300 miles; or a velocity of fifty miles an hour. *Cæteris paribus*, the velocity is least in shallow water and contracted channels.

The reader may probably be startled at the mention of such a velocity as 700 miles an hour, or twelve miles in a minute. But he must recollect that this is not the velocity of the *water*, but of the *waves*—not the rate at which the *substance*, but that at which the *form* is transferred. An undulation may run rapidly along, while the undulating substance does not run on at all; as may be seen in the waves which run along a field of corn on a gusty day, or the undulation along a stretched chain of rope. The *water* which makes the tide at Dover is not *that water* which made the tide at the Land's End six hours before, though the *elevation of the water* has been in that time transferred in a regular manner past every intermediate point of the coast. The rate at which the wave travels is no more identical with the rate at which the water moves, than the rate at which intelligence is conveyed by a line of telegraphs is identical with the rate at which the arms of the telegraphs move.

I may hereafter return to this subject; for the present I fear I may have wearied my readers.

[TO BE CONTINUED.]

AMERICAN PATENTS.

LIST OF AMERICAN PATENTS WHICH ISSUED IN MARCH, 1834.

With Remarks and Exemplifications, by the Editor.

1. For a *Vegetable Dentrifice:* Elijah H. Reed, Clarksville, Habersham county, Georgia, March 1.

We have presented to our readers many patents for things impossible to be done, and many, the specifications of which were obscure and inadequate, but we have now one of an entirely new genus, a perfect nondescript. There is no failure in an attempt to describe the thing, it is true, because no such attempt is made. All that we are informed about the composition of this Dentrifice is, that it "is prepared from a marine plant, by repeated calcination and ablution, by which the ligneous parts of the vegetable are rendered fine, and the excess of alkali removed, after which it is triturated to an impalpable powder." If the patentee, or his attorney, had read the patent law, he would have found that he was bound to give the "process of compounding the same, in such full, clear and exact terms, as to distinguish the same from all other things before known, and to enable any person skilled in the art or science, of which it is a branch, or with which it is most nearly connected, to make, compound, and use the same." All this the law requires to be done "before he can receive a patent." The grant in the present case ought to have been refused, as the conditions have not been complied with, and the instrument is consequently nugatory. It is about as valuable as cer-

tain deeds for tracts of land, in the township of *Luna*, which some speculators in the western part of New York, disposed of to persons who thought the plots very pretty upon paper.

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2. For constructing *Cisterns for holding Water, &c.*; Nathaniel Fortin and William Van Vleck, Sullivan, Madison county, New York, March 1.

What is called a *pattern curve*, which is like a tub without a bottom, is to be formed of the size of the intended reservoir; an excavation large enough to receive this pattern curve, and to allow of a due thickness for the intended wall, is then made, and the bottom of it covered with gravel, stones, &c. mixed with hydraulic lime. Upon this the curve is placed, and the space between it and the earth, is filled with like materials, and when dry, the staves, &c. which formed the curve, are to be removed. The claim is to, "first, the pattern curve, around which to construct the cistern, reservoir, or wall; and secondly, compounding the hydraulic cement with substances of any kind, and thus forming a permanent wall by means of the pattern curve."

We refer to the patent of G. Tibbetts, for our notice of a very similar contrivance, so similar, that so far as principles are concerned, we should denominate them identical. Patentees, however, are rarely aware that alterations in form or proportions, which still leave a thing essentially the same in its mode of action, are not protected by the patent law, such alterations being mere colourable pretexts, which, were they not resisted, would destroy its whole intention.

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3. For a *Loom for Weaving Coverlids, Carpets, and all kinds of Fancy Work;* Emanuel Meily, jr., John Mellinger, and Samuel Mellinger, Lebanon, Lebanon county, Pennsylvania, March 1.

In this loom there is some simplification of the arrangement of those parts by which the pattern is produced, although the general principle of such looms remains unchanged. The claims made refer to figures on the drawing, and do not admit of a description that would be understood by one not perfectly conversant with such machinery.

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4. For an agricultural instrument called an *Agricultural Pulverizer*; B. F. Stickney, Vistula, Monroe county, Michigan Territory, March 1.

There is a striking resemblance between this machine and that patented by Mr. Jas. D. Woodside, on the 28th of July, 1832, the main difference being in making the part which is to pulverize the ground, in the form of cultivator teeth, and allowing them to fall back by means of a hinge joint close to the roller, whilst in Mr. Woodside's machine they are permanent teeth, or spikes. The roller around which the cutters, or hoes, are fixed, receives its motion by gearing from wheels which roll upon the ground, and there is a

lever to raise or depress the roller, as in the former machine. It is also proposed to place spikes or pins on the faces of the wheels which run upon the ground, should the friction not be sufficient to drive the roller with its cutters. There is no claim made.

We have alluded to Mr. Woodside's patent, but find that our notice of it was accidentally omitted in its proper place; but as this instrument is now coming into use, we design, at an early day, to place the specification of it, with a cut, before our readers.

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5. For a *Thrashing Machine;* Daniel Davis and James Holmes, Fredericksburg, Spottsylvania county, Virginia, March 3.

Although there are seven different things distinctly pointed out, and claimed as improvements, the general construction of this thrashing machine is the same with those in most common use, and we shall not, therefore, detain the reader by pointing out what we consider as minute variations, although the patentees may esteem them of much importance.

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6. For a *Machine for making Wrought Nails, Spikes, Tacks, Horse Shoes, Rivets, Horse Shoe Nails, Screw Bolts, &c.;* William and Thomas Schuebly, Hagerstown, Washington county, Maryland, March 3.

We had not read beyond the title of this patent before being convinced that we were about to meet with an old acquaintance, one, however, who, we are sorry to say, has always failed in the business which he has undertaken to perform, whenever he has attempted to make nails, horse shoes, and other articles of wrought iron. He has had numerous partners, but has always lightened their purses, or involved them in debt, and we are well assured that if the gentlemen who have now taken him by the hand, should persevere in their patronage, they will wish that they had cut the acquaintance at an early day. What the patentee claims to be able to do is "the making nails, spikes, tacks, horse shoes, rivets, horse shoe nails, screw bolts, &c. &c. &c. by two cylinders with one half impression of each article to be made upon each, corresponding precisely with each, except the horse shoe, which varies, as the two sides are not alike, one side having a groove for nail holes, the other plain."

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7. For *Colouring Lamp Oil of different tints,* Ezra Bourne, city of New York, March 4.

To render the oil red, alkanet root is to be put into it, and to remain until the colour is sufficiently deep. For green, verdigris is to be used, grinding it, and allowing it to be rubbed up with a portion of oil; this may be poured into a cask, and the oil eventually strained. Cinnamon and cloves are to be used for a cinnamon colour, the colouring matter being extracted by a mixture of oil and spirits of turpentine. A deeper colour may be obtained by oil of pimento.

The foregoing contains the whole substance of the specification,

the modes of colouring not being claimed. From our brass lamps we could have supplied to the patentee a green colouring matter, which we have often thrown away; the colouring of oils by alkanet root, has been done thousands of times, and, for ourselves, we had rather use the cloves and cinnamon for other purposes. We can assure the patentee, that an easy mode of depriving oil of all colour, would be an invention much more likely to please the public than that for communicating colour thereto.

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8. For a *Machine for making Wrought Nails, Brads and Rivets;* William Slater, Clarksville, Clinton county, Ohio, March 5.

This machine is intended to form nails, &c. by means of rollers, and although we are convinced that it will not fulfil the expectations of the patentee, and know that there is no novelty in its general principle, there still is merit in its details. It is not proposed to form the heads of the nails by the operation of rolling, there being a separate movement for that purpose, consisting of a heading die, brought up by a crank motion, whilst the nail is gripped between the rollers. There is no claim made to any part of the machinery, but, as it is not likely to answer in practice, this omission is a point of little importance; were it otherwise it would be necessary to correct the evil by a surrender of the patent, and a reissue of it under a new specification.

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9. For a mode of *Ventilating Vessels;* Russel Jarvis, Boston, Massachusetts, March 5.

We are informed that "this invention or improvement consists in expelling or drawing foul air, humidity, and every kind of noxious vapour, from the vessel, and introducing, or injecting, at the same time, fresh air into the same vessel, without introducing water," &c. &c. The means proposed is the employment of condensing and exhausting pumps, to draw the foul air from the vessel, and introduce that which is fresh. It is proposed to place tubes leading down the masts into the hold, the masts being grooved to receive them, to prevent their interfering with its rotundity. Nothing peculiar is claimed in the construction of the pumps, or in the kind of machinery by which they are to be worked, the plans given being considered as mere exemplifications of the general principle.

The patentee expressly says, "I do not claim as a new invention, the pumps above mentioned, nor the engine above described. What I claim as new, and as my own invention, is the application of pipes, pumps, and wheel work, or other moving power, as above described. Or of pipes alone, fixtures in the vessel, as above described, to the ventilation of every kind of vessels."

He does not appear to be aware of what has already been done and published, upon the subject, or he would have known that his claim was essentially defective. As to that part in which he proposes merely to fix tubes through which foul air may escape, and others through which fresh air may enter, we view it as so entirely inade-

quate, and so inferior to the ordinary wind sails, that we shall not attempt to discuss its merits. With respect to the pumps for blowing and exhausting, we might refer to many other sources of information, but under the article VENTILATION, in Rees' Cyclopedia, enough will be found to convince any one that what was done upon the subject by Dr. Hales, as far back as the year 1741, would throw the present plan into the shade. There the whole arrangement is clearly and distinctly shown, whilst the specification before us leaves the thing claimed uncertain and obscure, in most of its points, and would enable the patentee, should he see one of Dr. Hales' ventilators at work, to say, "that is an invasion of my right."

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10. For *Saw Mill Dogs;* Martin Rich, Ithaca, Tomkins county, New York, March 6.

Several patents were obtained in the course of the year 1830, for dogs for saw mills, two of which were granted to the same individual to whom the foregoing was issued; these were dated Feb. 19th and April 13th of that year. In the present instance the manner of constructing the apparatus is described in a very general way, without designating what is relied upon to sustain the patent; and although there is sufficient difference between this and those formerly patented, still it was the duty of the patentee to point out this difference specifically. The main variation is in the use of a right and left handed screw, crossing the head block, instead of the sliding bar used to carry the bales, in those referred to.

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11. For a *Machine for Weighing Heavy Bodies;* Thaddeus and Erastus Fairbanks, St. Johnsbury, Caledonia county, Vermont. First patented June 13th, 1831. Patent surrendered and reissued upon an amended specification, March 6.

Having originally noticed this patent, we shall now insert the claim only, in the new specification.

"What we claim as new, and for which we ask a patent, is the knife edge hinges constructed in the manner and upon the principle hereinbefore set forth, and the employment of the pieces denominated rockers, with one lever attached to each, these being connected together at a point equidistant from their axes."

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12. For improvements in the *Machine for Weighing Heavy Bodies;* Thaddeus and Erastus Fairbanks, St. Johnsbury, Caledonia county, Vermont. First patented February 21st, 1832. Patent surrendered, and reissued upon an amended specification, March 6.

Both this and the specification of the last named patent, refer throughout to the drawings which accompany them, and which are perfectly descriptive. The claim, as made in the present instance, is in the following words: "What we claim as an improvement upon the weighing machine, as formerly patented by us, is the manner of

arranging and connecting together the levers attached to the rockers. We also claim the variation in the manner of arranging the rockers and the hinges, so as to place the former under the platform, as shown in the drawing; and likewise the mode of obtaining a vibratory motion in the supporting power by means of the standards (E, E,) which are used instead of the fulcrum, or prop; not intending, however, by these claims, to confine ourselves to the exact form and manner of constructing the various parts of our machine, as herein exemplified, but to vary the same as we may find convenient, in any way which produces similar effects, upon the same principles or modes of action.

We shall not here institute a comparison between these and other platform balances, but will observe, that after a fair opportunity of testing the weighing machines of Messrs. Fairbanks, we should not desire, for ordinary weighing, an instrument of greater accuracy. We have had one in our possession, calculated to weigh several hundred pounds, which, when unloaded, would turn by the weight of a small visiting card, and when fully loaded, indicated quarters of ounces.

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13. For an improvement in *Common Skates;* Nathaniel C. Sanford, Meriden, New Haven county, Connecticut, March 7.

The improvement claimed is in the manner of grooving the blade of the skate "with more than one channel on the bottom, and so as to have a flat or convex bearing on the bottom, between the two angular corners of the bottom of the instrument." All the residue of the instrument may be formed in the usual way. The annexed forms exhibit sections of the blade grooved in the manner proposed.

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14. For an improvement in the *Roller Gin for Separating the Seeds from Cotton;* William Whittemore, jr. West Cambridge, Middlesex county, Massachusetts, March 7.

The specification of this patent is one of considerable length, and refers throughout to the drawings. As the machine is one in which but few of our readers will feel an interest, we shall not attempt to epitomise the description, nor shall we give the claim, as this, without the drawings, would afford but little insight into the matter.

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15. For a mode of *Preventing the Forgery of Checks;* John D. Pope, Baltimore, Maryland, March 8.

This is one of those schemes which will never go into operation, as there are to be scales of check numbers for the use of each individual, and also to be lodged in the bank, for the purpose of indicating the number of checks which have been issued. To designate their amount, sets of steel types are to be made, with cutting edges, and with these, by means of a proper press, the numbers are to be cut out from the paper. In this plan there is no novelty; a proposition to

patent it was made some years since, and discouraged by the Editor, as one of those schemes which would not pay the cost.

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16. For a new *Mode of Constructing Steam-boats and other Vessels;* Henry Burden, city of Troy, Rensselaer county, New York, March 8.

(See specification.)

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17. For *Metallic Rims for Vault Lights;* Edward Rockwell, city of New York, March 8.

This patent, it appears, is taken for preparing a frame of cast iron to receive the lights of plano-convex, or other formed glass. "The invention claimed is the use of ornamental or plain cast metal frames, or chases, to protect *semi-plano* lights for vessels' decks, vaults under pavements, and other subterranean apartments; the glass being perfectly well protected, and the cast iron frame highly ornamental, and made of any size, shape, and of any metal, and to be used for all purposes."

Perhaps a patent of this kind may deprive all but the patentee of a right to put a glass light into a metal rim, but we do not, at present, believe that it will. The kind of glass mentioned, semi-plano, is a form with which we are not acquainted.

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18. For an improvement in the *Steam Engine;* John B. Emerson, city of New York, March 8.

(See Specification.)

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19. For a mode of *Manufacturing Boots, Shoes, Socks, &c. &c.;* William Atkinson, Tewksbury, Middlesex county, Massachusetts, March 8.

(See specification.)

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20. For an improvement in the mode of *Constructing Chimneys, Fire Places, Grates and Stoves, for the burning of Coal;* Ormsby M. Mitchel, Cincinnati, Hamilton county, Ohio, March 8.

To get rid of the dust in burning coal, what the patentee calls a "dust flue," is to be constructed, leading from the ash pit under the grate, behind it, up to the smoke flue, at or near the throat of the chimney. There may be a cover, or stopper, to the hole leading into the dust flue, to be used when required. Had the patentee visited the region where anthracite is burnt in grates, he would hardly have applied for a patent for a contrivance which is in almost universal operation.

The other part of the invention consists in making the lower bar of the grate hollow, or rather in the form of a trough, with a cover to keep out the ashes. This is to contain water, the evaporation of which is to prevent too great a degree of dryness in the air of the room. In close stoves, a contrivance for evaporation is undoubtedly very beneficial, and, indeed, in well closed rooms, where anthracite

fires are kept, there is usually too little aqueous vapour. The grates in question, however, are intended for bituminous coal, and we have never heard of, or felt, the same cause of complaint from this, as from anthracite. The contrivance for supplying moisture, in the grate before us, does not appear to be very well imagined, and, assuredly, the vapour which is generated, will, nearly the whole of it, pass up the chimney with the draft.

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21. For a *Machine for Fluting Wash Boards;* Edward Loud, Worcester county, Massachusetts, March 8.

A wheel with cutters upon its periphery, is to be made to revolve with rapidity, and the article to be fluted, placed upon a suitable bench, with a guide, is passed over the cutters.

We do not know that such a machine has been used for fluting wash boards, but we deem this of little importance, as there is no novelty in its construction; such machines, for cutting mouldings, and other purposes, have received repeated notice from us.

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22. For an improved *Cooking Stove;* Elisha D. Payne, city of New York, March 8.

(See specification.)

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23. For a *Chandelier, or Hanging Lamp;* William Lawrence, Meriden, New Haven county, Connecticut. First patented March 23, 1831. Patent surrendered, and reissued upon an amended specification, March 10.

This lamp was described in vol. 8, p. 18, and the claim quoted from the specification; this latter is considerably modified in the new instrument, and is in the following words: "I do not claim as my invention, the tubes for the wicks, nor the glass tube, nor the opening through the body of the lamp, simply; but what I do claim as my invention and improvement is the following combination, viz: the lamp with an opening through the body thereof, in such form, in relation to the wicks, as not materially to intercept the radiation of light, combined with the tubes for the wicks, and with a glass tube placed at a proper distance above the body of such a lamp, so as to cause such a current of air on each side of the wick, as to produce a white, clear and vivid light, and effect a combustion of the smoke."

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24. For a *Mill for Cracking or Grinding Corn or other Grain;* Benjamin Hinkley, Fayette, Kennebeck county, Maine, March 10.

The corn to be broken is put into a hopper having a longitudinal slot in the bottom of it, against which revolves a steel roller, about two and a half inches in diameter, and twelve inches long; the face of this roller is cut like a rasp or grater. A flat plate of wrought iron stands along the cylinder, their distance apart being adjusted by screws; and between these the grain descends when the roller is turned. To give the proper motion there is a cog wheel, pinion, and fly wheel,

fixed in the usual manner. The claim is to "the particular form of the solid steel cylinder shaft, and the indented, or rasping, surface made upon the grinding part of the same; and the flat surface of iron, and the manner of screwing and guaging the same to and from the cylinder."

The similarity between this machine and that of Webber Furbish, noticed vol. 13, p. 403, will be apparent to any one.

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25. For improvements in *Tanning;* Mark W. Jenkins, Baltimore, Maryland, March 10.

The improvements here patented are made upon the apparatus of Mr. Jacob Dawes. This, it is observed, consists of a lath, or piece of timber, across each end of the vat, near the top, having hooks in them upon which the skins are hung, so as to extend vertically from one end of the vat to the other. The improvement made by the present patentee consists of two horizontal movable frames, the outer one resting on two pins in the vat, and the inner one on pins in the outer, like the gimbals of a compass frame. On the end pieces of this latter, the hooks are placed, and the skins hung upon them.

To raise the frames, and move the whole if desired, from one vat to another, a car is made with two wheels, to span the vats, with a windlass, and suitable appendages.

The patentee says, "I can use either one frame or the two as improvements upon Mr. Dawes' manner of arranging and handling the skins. The application of the car, with its appendages, I believe to be altogether my own." If the patentee has not the permission of Mr. Dawes, he is mistaken in the idea of his right to use his plan because he has improved it. (See Stem and Wireman's patent, p. 109, August No.)

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26. For a *Vertical Wool Spinner;* William Sykes and George M. Conradt, Fredericktown, Frederick county, Maryland, March 10.

The novelty claimed in this machine consists in the mode of drawing the thread. The slubbing is put on to a roller in the usual way, and is conducted down to the spindles on the lower part of the machine; in descending, it passes between two segment rollers, that is, rollers which have opposite sides flattened, so as to remove about half of their touching surface; the roving in descending is embraced, alternately, between the two cylindrical parts. Similar rollers are placed a few inches below these, embracing the thread at the time it is free in the upper rollers; "and thus the operation of a continued drawing is performed, and at the same time the flyers give it the requisite twist. If hard twisted yarn is required, the pairs of rollers are placed nearer together; for loose yarn, further apart." The claim is confined to this part of the structure.

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27. For a *Machine for Cutting Shingles;* George Knode, Blacksburg, Montgomery county, Virginia, March 10.

The mode of making shingles here patented, although it is by

straight sawing, appears to be very roundabout. Boards are first to be sawed of a suitable width, and thick enough for two shingles, heel and point. These boards are then to be cut of shingle length, and confined between the sides of a frame made of scantling, and notched out so that when the boards are received between them, a saw-mill saw, passed straight along between the scantling, will cut each board, widthwise diagonally, and form it into two shingles. The mode of making the frame, of pressing the boards between the sides, and of confining them edgewise whilst being sawed, is described; but as there are many shingle machines that will make ten for its one, we think best to say no more about it.

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28. For an improvement in *Mill Spindles;* Frederick Fredly, Logan, Centre county, Pennsylvania, March 10.

On the spindle, below the bed stone, there is to be a cylindrical collar, turned perfectly true; three, or any other number, of flat friction wheels, bear against this collar, by their peripheries; these wheels may be about eighteen inches in diameter, and are to have steel axles, running in oil cups. An iron plate, with a suitable flanch, is to be so placed upon the bed stone, as to prevent grain from falling through; and balls, it is said, are placed around a cavity in the bottom of the spindle, to prevent its wearing. The description of this part is very obscure; the claim is to the friction wheels placed round the spindle, and the collar and flanch upon the plate to prevent the grain from passing through the eye of the bed. Nothing is here said about the balls.

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29. For a *Machine for Cleaning Clover Seed;* Samuel Raub, jr., Wilkesbarre, Luzerne county, Pennsylvania, March 10.

A cylinder and concave, adapted to each other, are to be covered with punched sheet iron, and "what is claimed as *new*, is the manner of constructing the cylinder and bed piece, in preparing the sheet iron, punched and made rough, as described in the above specification, and in the adaptation of the machine to the thrashing and cleaning of clover seed." Not quite new, we apprehend.

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30. For an apparatus for *Curing Smokey Chimneys;* Henry Pollock, Baltimore, Maryland, March 11.

The oft told tale of cold air admitted from without, under the hearth, and passing into a space behind the metal back of the fireplace, there to be heated, and thence admitted into the room, is here again repeated, without the variations. When the smoking is caused by currents blowing down, a quadrangular sheet iron cap is placed upon the top of the chimney; the top of the cap may be arched, and the smoke escape at each side, whilst two other openings are left below these, "made in the shape of the mouth piece of an organ pipe, and at these the smoke escapes when the current blows down;" or, perhaps, it might be best to say, that through these it is intended that the smoke should escape, in the case of a downward current.

31. For a *Hoisting Machine, for raising Heavy Bodies;* John Drummond, city of New York, March 11.

This hoisting machine consists of a combination of wheels and pinions, operating upon the same principle with many similar machines. The patentee has not pointed out those particular features in it by which he considers it as distinguished from other machines, but has merely described its construction, and claimed "the arrangement and adaptation of the several parts of the machine, so as to produce the hoisting machine before described."

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32. For a *Machine for Cutting and Trimming the Edges of Books and Paper;* Joseph Bateman, Harvard, Worcester county, Massachusetts, March 11.

The machine here patented is clearly described in the specification, well represented in the drawing, and has the merit of differing essentially from those previously patented for the same object. The body of the machine consists of three parallel bars, which may be eight feet long, and six inches square, placed horizontally, one above the other, and supported at suitable distances apart by end cheeks, bolts, &c. The lower bar forms the bed upon which the paper to be cut is placed; the middle bar is the follower, which is forced down by screws, and presses the paper, or books, to be cut, and the upper bar serves for the pressing screws to work in.

A sliding bar in front of the press, has in it eight knives, placed a foot apart; they are in form like the ordinary book binder's cutting knife, and are fixed in the sliding bar in such a way as to admit of their being properly adjusted, and the bar itself is so confined that whilst it slides freely, it can not swerve from its proper direction. A fly wheel and crank, connected to the sliding bar by a reach or pitman, gives to it the proper vibrating motion. The different adjustments we do not attempt to give, as these would require the whole specification. The claim is to "the simultaneous use of so many knives, brought to bear upon the books or paper to be cut, or trimmed, by turning the balance wheel, and the consequent operation of the weights, shafts, screws, and springs, above described."

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33. For an improvement in the construction of *Wheels for Carriages of all kinds;* Henry Beebe, Haverstraw, Rockland county, New York, March 12.

This wheel is to be made with a rim and spokes of wrought iron, and a hub of cast iron. The rim for a four feet six wheel, it is proposed to make of iron five-sixteenths thick, and one and three-eighths wide. After this is formed into a hoop, holes are to be bored in it to correspond with the number and size of the spokes; these latter are tapped, and have nuts on their outer ends, the screw slides freely within the holes in the rim, which are smooth. When the hub is to be cast, it is moulded in such a way that the bore to receive the axle, may have an enlarged opening in the centre, for the sake of lightness, and to contain oil, &c. The spokes, surrounded by the rim, are laid in the flask, so that the cast metal shall embrace

their inner ends. When cast, the wheel is placed upon an axle, and turned round to try if the rim is true; to make it so, the nuts are tightened up against it, and when true, the projecting ends of the spokes are removed, and heated tire put on. The claim is to "the whole of the machine, or wheel, above described, when taken together, and the mode and manner of constructing the same, particularly the principle of constructing the hub upon the iron or steel spokes. But no claim is made for the mode of making the hub, the spoke, the rim, or the tire, or any of the parts of the machine, or wheel, taken separately." The hubs of wheels have often been cast upon wrought iron spokes; it would seem, therefore, that the *particular principle* claimed, is not new. We doubt the goodness of the whole wheel, and particularly the durability of the connexion between the cast iron hub and wrought iron spokes.

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34. For *Manufacturing Tea Pots, and other Vessels of Brittania Ware;* William W. Crossman, Taunton, Bristol county, Massachusetts, March 12.

(See specification.)

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35. For a *Machine for Cutting Straw and Hay;* Joseph S. Bishop, Wayne, Kennebec county, Maine, March 12.

The material to be cut is placed upon a feeding apron, and carried between two rollers, the upper one of which is borne down by spiral springs. Two knives, revolving like the beaters of a cylinder thrashing machine, cut the straw, &c. as it passes over a bar of iron which they nearly touch. The speed of the feeding apron may be adjusted so as to determine the length of the straw when cut. Although there is little or no novelty either in the individual parts, or in their arrangement, the claims are very comprehensive, consisting of "the form and arrangement of the knives, also the construction of the wheels to govern the hay or straw, which I cut from one quarter of an inch to three inches, or more; and also all the arrangement of the above described machine, and also *any power that may be applied.*" After this, what man will be willing to turn his machine?

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36. For a *Smut Mill;* Parker Wing, of Verona, Oneida county, and Orlando Root, of Amsterdam, Montgomery county, New York, March 12.

This machine, besides scouring grain, is proposed to be applied to hulling, and to the grinding of bark. There are to be two cast iron round plates, placed like the stones of a mill, the lower plate being the runner, and the upper resting upon a suitable frame; this latter has an eye, surmounted by a hopper in its centre, and the spindle of the runner rests upon a bridge tree at its lower end. The faces of the plates are to be furrowed in the manner of the dress of a mill stone, and there is to be a curb, with holes to let out the dust, and a proper opening to discharge the grain. "What the patentees claim as original, is the dress of the plates, from eight to thirty-two quarters, with the draft of the same from the eye to the skirt of the plate; the

curb, the flanch on the running plate, the ring with its flanch, and the position in which they are placed to secure the grain; the mode of running the under plate, and the application of the machine to the purpose of grinding bark." If all these claims, severally and collectively, can be sustained, the patentees will be very fortunate.

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37. For *Generating Warm Air for Heating Buildings;* Joseph L. Dutton, Philadelphia, March 13.

Into the furnace for heating churches and other buildings, a cold air tube is to be introduced from without; it is to pass up through the centre of the furnace, its immediate contact with the fuel being prevented by surrounding it with grate bars, nearly in contact with it, which, by means of a handle, may be so moved as to stir the fire. Where the air tube rises above the fire it is enlarged, and surrounded by a sheet iron cover, tubes being so inserted as to increase the heating surface. The claim is to "the introduction of an interior column of cold air, and its application either to stoves, furnaces, &c. of the usual construction, or to any other apparatus for obtaining heat, together with the movable upright grate, or bars, for shaking the ashes."

The passing of air tubes through a fire, for the purpose of obtaining heat, is no new device. Dr. Nott's vibrating grate appears to have been pregnant with similar expedients, and its progeny is numerous.

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38. For a *Horse Power;* Jehial F. Axtell, Geneva, Ontario county, New York, March 13.

"The improvement claimed is in making the horse power of iron instead of wood or other materials, and for the manner in which the same is put together."—As there are many horse powers made of iron, this claim is good for nothing; and even had such not been the case, the making it of iron, without any novelty in its principle, would not be found to be that kind of improvement which the law requires; as to the manner of putting it together, there is nothing specified as new or peculiar, and nothing with which every workman is not familiar.

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39. For a *Machine for Shelling Corn;* Calvin Page, Sandbornton, Strafford county, New Hampshire, March 13.

(See specification.)

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40. For a machine for *Slicing Apples,* preparatory to drying; Daniel Davis, 2nd, Stafford, Tolland county, Connecticut, March 14.

Nine, or any other number, of knives, or cutters, are placed round the periphery of the segment of a small wheel, or rather half wheel, which is fixed against a vertical plank, and, by means of a small handle, turns upon a centre pin. The knives are not in the same plane, each of them being placed about one-sixth of an inch in advance of the one which preceded it. A recess, or hole, is cut in the vertical

plank, to receive the apple, in such a position that the first knife will cut a thin slice from it, the others continuing the operation; a vertical pin passes into the eye of the apple and a wire above, having a crank at its upper, and four prongs at its lower end, enters the other end of the apple, the wire sliding up and down in staples, to remove and replace it. When an apple is fixed, the knives are brought round, so as to slice its projecting side; the crank is then turned about one-third round, and the operation repeated, a third cutting completing it.

The whole arrangement being considered as new, no claim is made.

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41. For a machine for *Cutting Straw, Hay, &c.;* Ethel H. Porter, Lincolnboro', Lincoln county, North Carolina, March 14.

The cutting in this machine is effected by two knives upon a cast iron wheel, in a manner well known. The feeding trough, and feeding rollers, are also similar to those in many other machines. The claim is to "the construction of the frame and the feeding," in neither of which do we see any thing upon which to found a claim, and if any thing there be, it was the duty of the patentee to point it out.

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42. For a *Machine for Making Wrought Nails and Spikes;* William Osgood, and Ebenezer Hunt, city of Troy, Renselaer county, New York, March 14.

In this machine the nails are to be made from rolled or slit rods of the proper size for the body of the nail. The nail rod is to be put into the machine while hot, and the piece to form the nail is cut off, griped, pointed, and headed, at one operation. The patentees observe that the form of the machine may be so varied, that no description could comprehend all these variations, and that their claim is not therefore to the form, but to the modes of operation. The specification is carefully drawn up, and there is a good perspective representation of the machine, but still we think it defective in matters of detail, which can rarely be shown in a single perspective drawing. Those "modes of operation" upon which the patentees rely, are not at all set forth, but left to be inferred from the general description. Were it otherwise, we could not pretend, without adequate engravings, to present them to the reader, and shall not now make any attempt so to do.

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43. For a *Metallic Frame Hat Block;* Norris S. Canfield, Wilton, Fairfield county, Connecticut, March 14.

The object of this improvement is to form a hat block which shall admit of a free access of the dying liquor, and of air, in the operation of dying. A cylinder of wood, two or three inches in diameter, and a little longer than the crown of the hat, is to have wire, or strips of copper, or other suitable metal, attached to it in such a way that they may form a round cage, or reel-like apparatus, with the cylinder in the centre. Upon this the hat is to be placed when submitted to the action of the dye stuff, this operation being performed in the usual way. "The principle of this improvement consists in the mode of

constructing a frame hat block of wire, or strips of copper, or other metal, fixed in the ends of the piece of wood, by the ends thereof, and in sufficient numbers to support the crown in shape."

On turning to p. 120, it will be seen that Mr. Richard Pike, of Wilton, obtained a patent for a hat block intended to effect the same purpose, and essentially the same in its construction. We are clearly of opinion that one of them interferes with the other.

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44. For an improvement in the *Construction of Ploughs;* David Staebler, Lancaster, Lancaster county, Pennsylvania, March 15.

This is a wheeled plough, having two wheels in front, and one in the rear of the mould-board and coulter. The latter part may be either double or single. The form given to the frame is such as to adapt it to the wheels and other parts. The claim is to "the mode of making the entire frame work, as well as the manner of applying and using the plough share, coulter and mould-board."

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45. For *Stoves for Burning Anthracite and other Coal;* Abraham D. Spoor, Coxsackie, Greene county, New York, March 15.

The number of patents this month exceeds ninety, and for the purpose of giving the whole, it is necessary, with most of them, to make our remarks more brief than usual; but, for certain reasons us thereunto moving, we wish to give a somewhat extended notice of this stove; we shall place this notice among the specifications, to which, therefore, we refer.

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46. For an improvement in the *Manufacture of Bridle Bits;* Henry Pierce, Sharon, Litchfield county, Connecticut, March 15.

These bridle bits are to be made by twisting wire together, so as to form the several parts.

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47. For a *Machine to Raise Bags of Grain or Flour, for Shouldering;* John Kinman, Hartley, Union county, Pennsylvania, March 15.

An upright post is to be fixed in the floor, its lower end being rounded, and passing into a socket to allow it to turn round. A sliding box, having a bottom or shelf, upon which to place the bag, and a back and sides to sustain it, slides up and down upon this post, by means of a socket or box, behind that which holds the bag. Upon the post there is a rack, into which a pall, or catch, falls, so as to hold the box at any height to which it is raised. A tackle, or other apparatus, may be used to raise the box and bag to a suitable height for shouldering, when, on removing the catch, the box will again slide down to the bottom of the post.

48. For a *Machine for Shaving and Jointing Shingles*; Samuel B. Chapman, city of Burlington, Burlington county, New Jersey, March 15.

The description of this machine, and the drawing which accompanies it, have not sufficed to furnish us with a clear idea of its particular construction. The shingles, it appears, are to be forced between two knives parallel to each other, in doing which they are passed between two pairs of rollers, of wood or iron, one pair of which appears to be intended to guide them to, and the other to receive them in the delivery from, the knives. The jointing is to be effected by means of planes, each carrying three irons; but how the shingle is to be held whilst acted upon, does not appear. There is not any thing pointed out as new, or a claim made to any part of the apparatus.

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49. For an *Apparatus for Lighting Lamps and Candles;* Edmund Hubbard, and William L. Cheney, Chester, Hampden county, Massachusetts, March 17.

This "lamplighter" is merely a cylindrical lamp of small diameter, fixed on one end of a wooden handle, or rod. The burner, with its wick, may be screwed on in the ordinary way. Although the talents of two persons have been taxed in the production of this article, we are unable to see in what respect it is better than the instrument ordinarily used for lighting street lamps. In many cases it will be less convenient than that, as it will not admit of being so readily applied to the wick of the lamp or candle which it is to light.

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50. For an apparatus for *Extricating Horses from Carriages;* O. R. Broyles, Anderson Court House, Pendleton District, South Carolina, March 17.

In this apparatus the windlasses to which the leathers of the swingletrees are attached, are made capable of revolving so as to present their reversed sides to the horses, and so constructed as the swingletrees will, in that case, be detached, and the horses liberated. They are ordinarily held in their places by two levers, connected together by a rope at their extreme ends, but according to the present mode, their connexion is destroyed, and the horses freed by pulling a line which passes from them to the carriage. The plan appears to be relied on as altogether new, no claim being made to any part of it. The particular arrangement described may probably be original, but there are others bearing some analogy to it, equally simple, and operating equally well, which have been introduced, but have never gone into extended use. The fact is, that whilst we laugh at the sailor who objects to a cork jacket, or other life-preserver, because he is apprehensive that it may invite the catastrophe against which it is to guard, most of us neglect those precautions that are intended to protect us against *possible* danger only.

51. For a *Substitute for Lamp Oil, denominated Carbonated Alcohol;* Samuel Casey, Lebanon, York county, Maine, March 17.

The patentee's recipe is, take one gallon of alcohol and one pint of spirits of turpentine, shake them together, and add half a pound of camphor.

On the 16th of October, 1830, Mr. Isaiah Jennings obtained a patent for a mixture of alcohol and spirits of turpentine, as a substitute for oil. An account of this patent may be found at p. 75, vol. vii. We consider the present as a manifest invasion of the rights of Mr. Jennings, notwithstanding the addition of the camphor. The late fatal accidents resulting from the use of such ingredients in lamps, will, however, probably put a final stop to the use of these mixtures, and we have no doubt that a court of law would now decide that they are not useful, within the meaning of the statute.

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52. For a *Self-sharpening Plough Share:* Richard B. Chenoweth, city of Baltimore, state of Maryland, March 17.

The improvement is said to consist in the form of the share, and the manner of fastening it to the mould-board; it is stated, that the same mode of fastening was claimed by the patentee in a former patent, but without a share which admitted of a reversed application; in the present instance the share embraces both the share and point in one, and is so made as to be capable of being reversed or turned over; when the wear produces the proper sharpening for reversing again. The share being properly fitted to the mould-board, one bolt in the middle secures it in its place. The patentee claims "the form of the share, as embracing both share and points, and susceptible of a reverse application, and self-sharpening by the reversion of such application; with the manner of fastening the share on the mould-board."

As this mode of fastening has been previously claimed, it is not a legal subject of claim in the present patent, and would certainly vitiate it. The self-sharpening, by reversing, has been claimed by more than one patentee, and cannot now be sustained abstractedly, although it might, possibly, stand as applied to a new and improved form of share.

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53. For a *Percussion Pistol Whip;* Joshua Shaw, city of Philadelphia, March 17.

A percussion pistol is to be contained in the handle of a riding whip, the construction of it not differing materially from some of the pistols or rifles contained in canes. The thong is fastened to the end of a ferrule that is attached to the whip handle by a bayonet lock, and is to be removed before firing. The percussion cap stands immediately behind the pistol, and the charge is ignited through its centre. The pistol is cocked by drawing back a rod, which passes through the centre of the handle, and has a small button projecting at its head; and the depression of a small knob at the side, effects the discharge. The separate parts are not claimed as new, but the

whole in their state of combination, with the variations of which they are susceptible.

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54. For a *Machine for Dressing Staves for Barrels*; Solomon Crumber, Hemlock township, Columbia county, Pennsylvania, March 18.

(See specification.)

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55. For a mode of *Constructing and Combining Bells for Horses;* Jason Barton, Cairo, Greene county, New York, March 18.

(See specification.)

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56. For making *Earthen Pipes for the Conveyance of Water;* Andrew Coffman, New Market, Shenandoah county, Virginia, March 18.

A mould is to be made in two pieces, and a core to form the tube. The thing has been done hundreds of times in similar and better ways; it is in vain, therefore, that the patentee claims "the construction of the moulds, and the application of the said pipes."

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57. For a machine for *Hulling and Cleaning Clover Seed;* David Rankin, Augusta county, Virginia, March 18.

(See specification.)

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58. For *Softening Dried Hides and Skins for Tanning;* Isaac Robinson, city of Baltimore, State of Maryland, March 18.

The process adopted by the patentee is said to offer numerous advantages, in the saving of time and labour, in the correcting the tendency to taint, and improving the quality and weight of the leather. For four hundred pounds of hides, after having soaked them in water twenty-four hours, prepare a vat with water enough to cover them, and into a separate vessel put the following ingredients:—twenty pounds of potash, a peck of slacked lime, a peck of common salt, four pounds of Glauber's salt, one pound of saltpetre, two pounds of muriatic acid. Dissolve them in water, and put two-thirds of the solution into the vat, and soak the skins in it for twenty-four hours; draw them out and put in the remaining composition; into this they are to be placed, and drawn daily, until sufficiently raised, which usually requires about four days. This liquor is to be used with succeeding packs of skins, allowing them to lie twenty-four hours in it, before increasing its strength.

The patentee has, no doubt, tried the mixture for which he has obtained a patent, and, it is to be presumed, has found it to produce the effects specified by him; but, if so, other mixtures may be made which will answer equally well without interfering with his right, which, from the nature of things, is limited to the compound as given by him. The mixture is so entirely empirical that, with some claim to chemical knowledge, we scarcely think that we could execute the

task of tracing the action of the various ingredients upon each other; we, however, could substitute others, with very different names, which would produce a result substantially the same with that of the patented compound. These remarks are not made to decry the patent, but to show the importance of scientific knowledge to those engaged in the practice of the useful arts.

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59. For an improvement in *Machines for Hoisting Goods, or Weights, in Stores;* David Evans, city of Philadelphia, state of Pennsylvania, March 19.

The wheels ordinarily used in stores for hoisting goods, are, it is said, always constructed of wood; the patentee, however, means to make them of iron, but in all other respects they are to remain unchanged. Such a patent we consider as altogether valueless, and if we preferred a wheel of iron to one of wood, should unhesitatingly make it, maugre all the terrors of the patent law, and the seal of the United States.

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60. For *Attaching Bolting Cloths to Reels;* George M. Elliot, Hagerstown, Washington county, Maryland, March 19.

The reel is to be constructed in the ordinary way, with no other than such trifling variation as will adapt it to the mode of fastening adopted. The main feature of the improvement consists in the employment of two strips of wood, of the length of the ribs of the reel, to which are nailed the two ends of the bolting cloth, properly strengthened by strips of linen; these two strips, when brought together on their flat sides, form a rib external to the reel, and when they are affixed to each other by three, or more, screws and nuts, the cloth will be of the proper tension. The ends of the cloth are furnished with oilet holes, which pass over pins at each end of the reel. By this contrivance the cloth is readily removed, cleaned and replaced. The claim is "to the principle of affixing the cloth to the reel, so that it can be taken off and replaced with celerity and safety." We think the claim objectionable, as it is the mode only of doing this, and not the principle, that is patentable; had the word foregoing been inserted before principle, our objection would have been removed, as the acceptation of the word principle would then have been plain.

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61. For an improvement in the apparatus for *Spinning Cotton or other Fibrous Substances;* Asael L. Lanpher, Killingly, Windham county, Connecticut, March 19.

(See specification.)

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62. For an improvement in the *Mode of Fastening together the Planks of a Boat or other Vessel;* Thomas Blanchard, city of New York, March 20.

(See description, with specifications.)

63. For an improvement in *Buckets for Water Wheels;* William M. Eldridge, city of Philadelphia, March 20.

This wheel is called "the united power wheel," and the improvement is said to "consist in so constructing and arranging the buckets of a horizontal wheel, that the water when taken in at the top of the bucket, near the periphery of the wheel, and discharged at the bottom or side, shall act upon the wheel first with an impinging, and afterwards by a reacting power."

Various forms of construction appear to be contemplated: in the exemplification given, the buckets descend spirally down the periphery of a horizontal wheel, a hoop of wood, or of metal, surrounding them, and forming the outside of the wheel. A penstock rises above the wheel, and has a bottom just above it, through which there are openings to conduct the water upon the buckets in such a direction as to cause it to act by its impulse. The part claimed is "the form, shape, and position of the buckets, that being such as to combine the powers of impulse and reaction."

We have repeatedly spoken our opinion of such wheels, and see nothing in that before us to give it any superiority over some of its predecessors, as it varies from them but little, if at all.

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64. For a *Double Power Reaction Wheel;* William M. Eldridge, city of Philadelphia, March 20.

This is a very promising wheel, as the specification sets out with the information that it is "to give double power with the same water." Should this be correct, we see no reason whatever for stopping at a double power, the same principle being applicable to any extent.

A reaction wheel of the ordinary construction, with the penstock as usual, is first to be constructed; this wheel is to be surrounded by another, the inner diameter of which is such as will enable it to pass over the first, touching it as nearly as may be. From this outer wheel arms may extend underneath the inner one, the shaft of which is made hollow, to receive that of the outer wheel. The water is to be admitted into the inner wheel at its lower side.

The patentee says, "What I claim as my improvement or discovery, is the combining the powers of the two wheels, by applying the outer wheel to the circumference of the inner wheel, so as to receive the water as it is discharged from said inner or reaction wheel, which, in common reaction wheels now used, falls useless."

Should the water from the first wheel have any power to turn the second, this would simply prove that the first was badly constructed; and the contrivance before us would be much such a remedy for the defect as the placing two nine foot wheels, one below the other, where there was a fall of eighteen feet.

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65. For a *Nail Machine;* Melville Otis, East Bridgewater, Plymouth county, Massachusetts, March 20.

This is a machine for making and heading cut nails, and intended as an improvement upon Reed's machine for cutting and heading.

The whole machine is described, but the only thing claimed is the "adding to the machine heretofore in use, an instrument called the *spring nipper*, by means of which the nail is turned into the die, so as to be griped by the dies on its flat side, instead of the edges." The manner of constructing and of operating with the spring nipper, is particularly described; but for a clear understanding of these, the drawings would be necessary.

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66. For a *Mortising Machine;* Jeremy W. Bliss, Somers, Tolland county, Connecticut, March 20.

This machine is described with a minute account of the measurement of its different parts, and is represented in the drawing with sufficient clearness, but there is no claim made to the general arrangement, or to any of its individual parts, whilst, as machines for mortising are numerous, and as the mode of boring to commence the mortise, and of operating with the chisel, are very similar in most of them, it becomes important to the patentee to be very specific in pointing out what he claims as new. In this machine the stuff to be mortised is placed upon a suitable bed, so that it may be bored by a bit at the lower end of a revolving, vertical shaft; the piece is then so shifted as to bring the part to be mortised under the chisel, and the band thrown from the whirl of the boring on to that of the mortising part, which, by a crank motion, operating upon a lever, works the chisel up and down.

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67. For *Generating Steam;* Thomas Spalding, Mackintosh county, Georgia, March 22.

Boilers are to be made in any of the usual forms, and either of copper or of iron, as may be preferred. The bottom of the boiler is to be double, allowing a space of some inches between the two plates, and to the upper one, tubes are to be attached which are to rise up through the water, and top of the boiler, into the atmosphere, thus opening a free communication between the above named space and the air. This space is to be filled with tallow, or other animal or vegetable oil, which becomes an intermedium through which the heat must pass from the fire in arriving at the water. The upper part or the boiler, is to be "of either copper, or iron, *tinned iron*, or cast iron," and over this is to be laid hemp, or hemp cloth, saturated with paste or glue, in such thickness "as may give a perfect security against the possibility of bursting under any pressure that can possibly be required." Reference is here made to some experiments performed in France, tending to prove that hemp, kept together by glue, is twice as strong as English bar iron of the same section.—Over all these a light net work of copper or iron is to be placed. Strong hoops of iron are also to be employed, to give additional support to the boilers. Safety valves, &c. as usual, are to be employed.

Should the water become entirely exhausted from the boiler, we are told that the tallow will then evaporate, with a peculiar noise and a characteristic appearance, "and give an admonitory sound sufficient to alarm any passenger." We think, however, that there would in

case of such alarm, be more fear than danger, as empty boilers are not apt to burst. What benefit the hemp and glue can produce, unless they are continued all round the boiler, excepting as bad conductors, we cannot perceive; in contact with the fire, they would not certainly be very available. The intermedium of tallow appears to present several disadvantages without any corresponding benefit; and, in fact, the whole plan seems to manifest a want of practical knowledge of the subject to which the patent refers.

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68. For a *Machine for Cleaning Fur;* Shepherd Whitman, New Albany, Floyd county, Indiana, March 22.

The fur is to be placed in a box, or case, about seven feet long, in which it is to be acted upon by a blowing apparatus, or wind wheel, for the purpose of separating it from the hair. The wind wheel is of the usual construction, but there are wire points fixed along the edges of the vanes, to pick the fur; there are two rollers within the box at the lower end, around one of which a revolving apron passes, while the other is borne down upon it by means of springs. This latter roller has fur glued to it, the better to hold and press the fur to be acted upon. The far end of the machine is in the form of a vertical half circle, covered with a wire hurdle, through which the hair passes, the fur adhering together, and being blown round, without passing out with the hair. When necessary, the fur is to be acted upon several times. The description is not very clearly given, and the drawing is an indifferent one.

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69. For a *Thrashing Machine, and Horse Power;* John V. A. Wemple, Florida, Montgomery county, New York, March 25.

After describing the thrashing machine, a claim is made to "the formation of the teeth, and the construction of the dust discharger; also the lining of the boxes with zinc."

The formation of the teeth presents nothing peculiar; the dust discharger is an opening left in the cover; and the boxes in which the journals of the cylinder run, are to be of cast iron, lined with zinc. We advise, by all means, that the boxes be cast hard, and that the *improved* lining be dispensed with.

In the horse power, the claim is to "the construction of the frame, and the application of the gearing," in neither of which is there any thing that can be called an improvement. There is another strong objection to this patent; namely, it includes two distinct and separate machines, as the horse power no more makes a part of the thrashing machine, than it does of any other instrument which it might be employed to drive.

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70. For an improved *Floating Dry Dock*, invented by John Thomas, of the city of St. Louis, Missouri, and assigned by him to James H. Peck and others, to whom the patent has issued; March 26.

We must give a very brief description of this apparatus, abstracted

from upwards of twenty closely written pages of specification. This floating dock is intended to be passed under a steam-boat or other vessel, by filling the floats of which it is composed, with water, which is then to be pumped out, giving to the dock sufficient buoyancy to raise its load above the water. There may be nine rectangular floats, each sixty feet long, four wide, and four feet six inches deep, their sides being all parallel, and their decks flush; they may be arranged side by side, so as to form a large floating dock. A cradle to sustain the vessel to be raised, is made in separate parts, so as to fix properly on the general deck of the combined floats. Each float is divided into compartments by partitions, for the purpose of giving it the necessary strength, but there is a free communication between these compartments, to allow of the pumping out of the water, when the vessel is to be raised, particular provision being made for this purpose by apparatus specially described; but the limits which we have prescribed to ourselves prevent our touching these and other parts. "Which said partitions, decks, chambers, trunks, well, floats, and union of several floats together, to form the dock, are all, and every of them, new and useful improvements on the floating dry dock invented by the said Thomas, for all and every of which he solicits a patent, according to the laws of the United States in that behalf made and provided."

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71. For a *Machine for Hulling Clover Seed;* William E. Lukens, Cadiz, Harrison county, Ohio, March 26.

A cylinder is to be made, the periphery of which is covered with iron, cast in segments, with indentations, or furrows, for rubbing out the seed; and under this there is to be a concave, enclosing the cylinder for nearly one-half its circumference. There is nothing special in the construction of any part, or that is likely to render it superior in any respect to the machines already in use, some of which are very similar to it. The claim is to "the peculiar combination and arrangement of the several parts, but particularly the mode of preventing the seed from crowding in the end of the cylinder, and of conducting it to the place of escape."

The method of preventing the crowding, above alluded to, is the spiral direction given to the flutes on the cast iron segments of the roller, and of corresponding segments placed within the concave. There are some special directions given respecting the manner of forming and of uniting certain parts, but these, not being illustrated in the drawing, are somewhat obscure.

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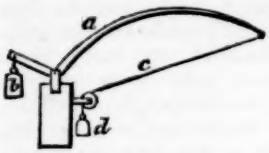
72. For an improvement in the *Application of the Lever Power;* Jacob Cochran, South Hadley, Hampshire county, Massachusetts, March 26.

This invention the patentee denominates "Cochran's Accumulating Lever," but if he makes no other discovery to which his name may be attached, and with which it may swim down the stream of



time, it will sink at an early part of the voyage. *a* is the lever, the long end of which is bent as shown, and to the short end is suspended *b*, the weight to be raised. *c* is a returning lever, chain, or cord, which is to pass over a pulley, as shown, and a small weight, *d*, attached to it, "when it will be found that with equal speed and time, a less weight applied to the lower extremity of the returning lever, will raise or put in motion, a greater weight or power applied to the end of the lever first mentioned," (the short end.)

We do not think it necessary to insert the claim, or to waste a word of reasoning upon the subject of the contrivance.

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73. For a *Rotary Coal Sifter;* Jesse E. Dow, William M. Edwards, and Samuel Davis, Charlestown, Middlesex county, Massachusetts, March 27.

The rotary coal sifter is to be made of wire, sheet iron, or other material, so that it may have openings to retain pieces of coal of the size required. It is to be cylindrical, hung in an air tight box upon gudgeons, and to be turned by a crank. It, however, may be used without the box, and the inventors claim it in all forms and positions, and also "the right to screen coals at wharves, or at mines, on a large scale; and they claim the shape of the sifter, and all its parts, as their own invention."

Some of the coal merchants on the rivers Schuylkill and Delaware, and in other places, would think it somewhat hard to pay for a right to use their old machines, after employing them for years untrammelled by any claimant; we advise them, however, not to be very much alarmed, as there is no probability of their being amerced in ruinous damages for so doing.

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74. For a machine for *Raising Building Materials,* called a "Builder's Tender," Chester Samson, Brattleboro', Windham county, Vermont, March 27.

An inclined plane is to be made of plank, reaching from the ground to the scaffolding; the materials wanted are to be put into a carriage upon four wheels, and drawn up by means of a rope and windlass.

Although patents are frequently obtained for contrivances which are old and worthless, we do not often meet with one so truly trifling as that before us, and so little applicable to the purpose which it is intended to answer. An inclined plane, successively altered in its elevations, until it reach the top of a high building, is not likely to be much used.

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75. For a *Thrashing Machine;* Silvanus Leonard, Hampden, Penobscot county, Maine, March 27.

In most instances, an attempt is made to prove that there is something new in the thing patented, although it may be nothing more

than a bolt, a pin, or a nail, used or driven in a new place; in the present instance, there is a part which is denominated the "inclined graduating slide, so acted on by springs at its extremity, as to sink, or yield, should any foreign substance, as stone or wood, come in contact with the beater; thereby avoiding the risk of damage hitherto incurred when these parts are fixtures." The graduating slide is but another name for the concave, which, we have no doubt, has, in at least a hundred of the patented thrashing machines, been prescribed to be hung upon springs. Neither this, however, nor any thing else, is claimed as new, and it is a mere matter of inference, therefore, that it was intended to be presented as such.

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76. For a *New Fibrous Material to be used in Manufactures;* Margaret Gerrish, Salem, Essex county, Massachusetts, March 27.

The new material designated as the subject of this patent, is obtained from the cortex of the *asclepias syriaca*, known under the common name of *silk weed*, or *milk weed*, and *Syrian swallow wort*, a native of the United States. The description of it in Dr. Bigelow's "Florula Bostoniensis," and in other works, is alluded to in the specification. The mode of obtaining the fibres, recommended by the patentee, is to take the stems, divide the bark longitudinally into four parts, and strip it off, which may be effected with much facility. On making a partial transverse section and bending the bark, the glossy, silk-like fibres, make their appearance, and may be drawn out in lengths of from two to three feet. After the necessary preparation, these fibres may be spun, coloured, and used as other fibrous materials. The specification contains a good deal of matter which may be considered as altogether extraneous in such an instrument, as it has nothing to do with the security of the patent; we therefore, pass this part over, having stated the object of the patent, which is simply to secure the right to the introduction of the substance designated as a new material for the manufacture of thread, cloth, and other similar fabrics.

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77. For an improvement in the *Gridiron;* Ami Clark, Berlin, Hartford county, Connecticut, March 28.

This gridiron is to be made round, square, or otherwise, and is to revolve upon its centre, like other revolving gridirons. The bars also, are to be fluted, as heretofore, for the purpose of collecting the gravy; but it is to differ from other gridirons much in the same way in which the kangaroo differs from other quadrupeds, namely, in the relative length of its hind and fore legs, in order to give to the gravy the proper disposition to descend into the receptacle prepared for it. Those cooks who have gridirons with legs of equal length, if any such there be, which we very much doubt, will, we hope, consider themselves as still at liberty to prop them on one side, in any degree which they may find convenient; and should there be in existence such a thing as a gridiron with fluted bars, a trough for the gravy, and hind legs longer than the fore, such as we remember to have seen in those

days when a sop in the pan was accounted a great delicacy, it may continue to stand out of the horizontal, without obtaining a new lease.

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78. For an improvement in the *Steam Engine;* Zechariah Allen, Providence, Rhode Island, March 28.

The intention of the improvement proposed in this patent, is the cutting off the steam at any desired part of the stroke, so as to allow it to work expansively during the remainder of it; and were we uninformed respecting what has been done upon this subject, the specification before us would lead to the conclusion that the effecting this was in itself a novelty, whilst those well acquainted with the history of the steam engine, are aware that it was done by Watt, and that at an early period of his career of improvements in the steam engine. Various plans have been devised for effecting this object, and the best engines are now thus worked.

The patentee considers the ordinary action of the throttle valve, as operated upon by the regulator, to increase or diminish the supply of steam from the boiler to the cylinder, as destructive of the power of a considerable portion of steam, and says that his "improvement consists in so arranging the apparatus of the steam valves as to cause the steam to pass freely from the boiler to act upon the piston with its full pressure during a longer or shorter period, or portion of each respective stroke, instead of wasting ineffectually the force of the steam by choaking its passage through the throttle valve, which, as its name figuratively implies, throttles the steam in the pipe, in its progress from the boiler to the engine, in order to destroy a portion of its too active force." "A portion of the steam is unprofitably wasted by being *wire drawn*, as it has been termed, through the contracted passage of the throttle valve," and more to the same effect. We dissent entirely from this doctrine, being convinced that there is very little, if any, loss of power from the prescribed cause, but merely a diminished quantity expended, the remainder being packed in the boiler for future use. One of the advantages of using steam expansively, results from the accordance of its action with the crank motion, as connected with a reciprocating piston. The stroke is to be gradually stopped, at each end of the cylinder, and the admission of steam during the whole stroke, is necessarily wasteful in the extreme. We, however, must leave the discussion of this point, as occupying more space than can be here afforded to it.

The patentee has described and figured a plan for cutting off the steam at different parts of the stroke, but as it appears to be intended as an exemplification of a general principle, he has not claimed it; in this point we think him incorrect, the principle being old, and the particular plan, we believe, new. The lever which is to open and close the valve of the induction pipe, is to be operated upon at its extreme end by a cam, the lifting part of which is wedge-shaped, and the lever being capable of bearing on its wide or its narrow end, opens the valve for a longer or a shorter period. The shaft, or axis, of the lever is a screw, and a whirl upon this shaft, acted upon by a regu-

lator, or governor, causes the lever to traverse upon its shaft, and thus cuts off the steam at an earlier or a later period of the stroke.

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79. For a *Portable Oven;* David Hull, Utica, Oneida county, New York, March 28.

There is to be an oven of tin, or other material, that is to have a door on one side through which to introduce the article to be baked. Two or more vertical pipes, apparently like stove pipes, are to pass through the oven, and these are to have gratings at their lower end to sustain the fuel, which is to be put in at the upper ends of the pipes. Near to the upper ends there are dampers to close the pipes when the fire is in full action, and under their lower ends, cups or dishes are to be placed to receive the ashes. "The principle upon which the petitioner's oven operates is in the use of fuel in such a manner that none of the heat to be created thereby shall be lost or wasted," a principle which appears to be as imperfectly carried out in this contrivance, as in most of its predecessors.

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80. For an improvement in the *Fliers of Double Speeders;* Otis Pettee, Newton, Middlesex county, Massachusetts, March 28.

The fliers of double speeders are usually made of several pieces of metal, the arms of wrought iron, the nose of steel, the bottoms of wrought iron, or steel, and the tubes of copper; the improvement consists in making the flier in one entire piece of malleable cast iron, in the manner described. The part which is to form the groove is, when delivered from the mould, open like the pod of an augur, and requires to be closed. The flier is formed into proper shape, and straightened by a pair of heavy dies fixed in a drop press, and the tubes are formed by dies made for the purpose, which close the open pod, so as to leave the required groove. The process is described with sufficient clearness, and the plan appears to be one which offers no small saving in the formation of the article patented.

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81. For an improvement in the *Machinery for Spinning Cotton;* Welcome A. Potter, Cranston, Providence county, Rhode Island, March 28.

Two metallic washers are to be substituted for the cloth washers, and are to regulate the drag of the spindle. The washers are to differ in size, the larger, represented as exceeding that of a dollar, is to be secured to the wave or bobbin rail by small screws, the spindle passing through a hole in its centre; the smaller washer, about the size of a large quarter dollar, is to be secured on to the end of the bobbin. This has a projecting rim, or fillet, on its edge, and, we suppose, that the friction of this upon the lower washer is to regulate the drag; in this, however, we are left to conjecture, and whilst employed in guessing, we guess that the friction created in this way will be very unequal, and not susceptible of being regulated.

82. For *Manufacturing Wire of Different Forms, and of Various Metals*; Thomas Wallace, Haverstraw, Rockland county, New York; an alien who has given notice of his intention to become a citizen of the United States; March 28.

The wire is to be formed, in the well known way, by grooved rollers, the employment of which makes no part of the claim, the improvement consisting in making the wire from circular plates of metal. Sheet metal is to be cut into circular disks, and these are to be cut into strips by circular revolving shears, the circular sheets being perforated at their centres, to allow them to pass over a pin fixed in a slide on a rail-way, by which they are fed to the shears. The claim is to "the cutting out a continuous rod, line, or thread, from a circular piece of sheet metal, as if it was merely uncoiling it, and making wire from such rod, line, or thread, of metal."

The patentee has left a request at the office that his patent might not be published in this Journal. What motive he has for making this request is not stated, and he is hereby informed that it is one which is not in the power of the office to grant, and over which it has no control; if he has any complaint to make, therefore, it must be directed against the Editor alone, who, knowing no reason why the request should be complied with, pursues his usual course. Patents are public instruments, and every citizen has a right to obtain and publish any specification; without this, the public would be liable to perpetual imposition from the patenting of machines and processes in use elsewhere. Had the request been made to the Editor, without the statement of a satisfactory reason, it would not have been complied with, although he is always willing to *delay* the publication of patents, in order to promote the interest of patentees, provided that of the public does not appear to be thereby compromitted.

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83. For a *Lamp for Burning Alcohol and Spirits of Turpentine*; Daniel Gilbert, Brattleboro', Windham county, Vermont, March 29.

In this lamp the alcohol and turpentine are to be separately converted into vapour, and to be ignited as they combine. A metal lamp is to be divided into two compartments by a horizontal partition, which may be at about one-third of its height from the bottom. The lower chamber is to be filled with spirits of turpentine through a tube leading into it, and extending above the top of the lamp; a similar tube enters the upper chamber, for the purpose of filling it with alcohol. The burner, in the centre of the lamp, and extending to the height of some inches from the top, consists in part of two concentric tubes, with a space between them; the inner of these tubes extends down into the turpentine chamber, and is furnished with a wick, reaching nearly to its top, in order to raise the spirit by capillary attraction; the larger tube descends into the alcohol chamber, whence that also rises by means of cotton or other fibrous material occupying the space between the two tubes, this cotton also terminating at the same distance below the top, as the turpentine wick. A

brass cap screws into the upper end of the burner, and has lateral perforations in it, through which the vapour escapes, and at which it is to be ignited; by raising or lowering the cap, the apertures may be enlarged, or lessened.

To adapt the common lamp to the purpose, two parts of turpentine, and one of alcohol, are to be put into it, the alcohol being of such strength as to float upon the surface. The tube is to be provided with its cap, and managed, generally, as in the former instance.

We do not believe that this lamp will be approved, as there are no means of regulating the proportionate quantities of the spirits which are to enter into combustion, and there will frequently be a strong smell of oil of turpentine. The plan of Mr. Jennings, in which the two fluids are perfectly combined, is, we think, altogether to be preferred on several accounts, but they are both dangerous.

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84. For a *Steam Boiler;* Russel Jarvis, Boston, Massachusetts, March 29.

The ordinary cylindrical boiler is to be surrounded by a strong case, like a second boiler; and from this, safety tubes are to lead to the outside of a boat or building, which safety tubes are to carry off the steam and water, should the boiler explode within the case. The fire hole, or flue, must pass through the heads of the outer case, which heads are represented as in close contact with those of the boiler.

The inefficiency of the plan proposed must be apparent to any one who has duly considered the force exerted in most of the explosions which have taken place. The idea of the contents of the boiler passing through the safety tubes, is altogether futile, and the danger from the collapsing of the flue, has not even a pretended preventive in the plan before us.

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85. For an improvement in the *Construction of Wheels for Carriages, in order to prevent Horses running away;* Russel Jarvis, Boston, Massachusetts, March 29.

The specification of this patent is contained in but few words, informing us that the invention consists in the fixing of teeth to the inner end of the hub, and the hinging of bars upon the axletrees, the outer ends of which may be made to catch between these teeth, when a string is drawn by the driver, or passengers, in case of the horses running away.

Among the various plans devised for the same purpose, we think this one of the most objectionable; to attempt to stop the motion of the wheels suddenly, when horses are running away, by a bar falling into teeth so close to the centre of motion, would be vain; something, assuredly, must give way before the power exerted. On a former occasion, when a similar plan was patented, in which the spokes were to answer the purpose of the teeth in the present instance, we observed that "a contrivance for breaking spokes" would be a suitable title for the invention. A brake acting upon the rim would be generally preferred to a break close to the hub.

86. For an improved *Ventilating Stove;* Daniel Quimby, Calais, Washington county, Maine, March 29.

The patentee claims "the ventilating apartments by air passing between, and in contact with, sheets of heated iron, or some other metal that will withstand fire," a claim about as valid as the ventilating them by perforating them for doors and windows. The plan proposed of carrying this principle into effect is so old, that the period of its invention, and the name of its inventor, are both lost among the records of "auld lang syne." It consists in making a stove with double plates, the fire being contained in the inner box, and air admitted through a tube, or tubes, into the space between the two, and conducted off by others, as required.

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87. For a *Retaining Oven for Baking and other Cooking;* Stephen J. Gold, Cornwall, Litchfield county, Connecticut, March 29.

The oven, as represented, is made square, much like those frequently set in the jambs of kitchens. It is to be made of double sheet tin, or other material that is an *imperfect conductor of heat*, (we had supposed tin to be a very good conductor) and air, another imperfect conductor, is to be confined between the sheets of metal. There are to be shelves within, and the furnace is also to be placed within, in a hole, or receptacle prepared for it at the lower part; a smoke pipe leading out through one side. The claim is to "the location of the furnace, that is, inside an oven, or air confining oven."

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88. For a *Furnace for Warming Rooms with Rarified Air;* John Bouis, Baltimore, Maryland, March 29.

This furnace is to be placed in a cellar, and is furnished with tubes for the distribution of heated, and the supply of cold air, in a manner resembling many other structures for the same purpose. Some of the tubes are to be double, charcoal in powder being put into the cavity between them. The brick walls enclosing the fire are also to be double, and to contain pulverized charcoal between them. We do not perceive in any part of the arrangement any thing special by which to characterize it. The claim is to the "described apparatus for warming rooms; particularly the double walled chamber containing the pulverized charcoal, which encloses the apparatus, and serves as a nonconductor, for warm or cold air; the receiver, with the pipes connected with it; the continuous pipes that receive the cold air from the apartments to be heated; the double pipes with pulverized charcoal; and the reservoir for containing water for tempering the heated air."

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89. For *Improvements in Lamps;* Jacob Keim, city of Philadelphia, March 29.

(See specification.)

90. For *Stoves for Cooking and other purposes;* John Harriman, Haverill, Essex county, Massachusetts, March 31.
(See specification.)

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91. For *Welding, or Cementing together Scraps of Horns, Hoofs, Whalebone, &c.;* Arad B. Newton, city of Baltimore, March 31.

This specification describes processes which are well known, and have been long practiced; a press also, is described, in which a follower is forced down upon a bed piece by two nuts, acting upon male screws, in the ordinary way. Two pieces of horn, shell, hoof, &c. intended to be united, are fitted together, with their surfaces perfectly clean, and are to be placed in a press, or vice, taken out of boiling water; when firmly screwed together, they are to be boiled for fifteen or twenty minutes. Scraps are to be treated in a similar way, but they must be forced into moulds of the form intended to be given to the article. These substances, it is observed, may be united by heat, without the presence of water, but the process by means of the latter is preferred. With all this, and much more, we have been acquainted for many years, and when first known to us, it was old to the workmen in the materials spoken of. The only article in the specification in which we find any novelty, is the information "that soft water, as rain or other light water, answers both for horns and hoofs, but for whalebone, and shell scraps, salt water is found to answer best." Of the correctness of this remark, we have but little doubt, and are of opinion that it results from the latter articles requiring more heat than the former; and salt water, when boiling, is at a higher temperature than that which is fresh.

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92. For improved *Bedstead Fastenings;* Perry Prettyman, Georgetown, Sussex county, Delaware, March 31.

The rails are to be tenoned and the posts mortised, in the way usual when screws are used. The rails are to be bored, as for screws, and an iron bolt is to be driven into the holes, and securely pinned there; the outer ends of these bolts are to be formed like the catch of a thumb latch, the catch part not being square, however, but forming an angle somewhat obtuse with the shank of the bolt; the catch, or hook, stands about one-fourth of an inch clear of the tenon. An iron plate, mortised to admit the catch, is screwed firmly against the bottom of the mortise in the post, and when the catch enters through the mortise in this plate, and is forced downwards, the rail is drawn close to the post, and the weight upon the bedstead tends to keep them always together. The tenon is to be shouldered down at the ends, to allow of the necessary play, and to cover the mortise when the bedstead is put together. The claim is to "the peculiar arrangement of the oblique shouldered hooks or catches, fastened as herein described, in the ends of the tenons of the rails; and the straps in the bottoms of the mortises, so as to produce a close fitting connexion of the parts, and at the same time easy to be put together, or taken apart."

93. For *Machinery for Boring and Mortising Hubs for Wheels;* Robert M'Carty, Martinsburg, Lewis county, New York, March 31.

(See specification.)

SPECIFICATIONS OF AMERICAN PATENTS.

Specification of a Patent for Improvements in the Steam Engine, and the mode of propelling therewith. Granted to JOHN BROWN EMERSON, *city of New York, March* 8, 1834.

To all whom it may concern, be it known, that I, John Brown Emerson, of the city of New York, have invented certain improvements in the steam engine, and in the mode of propelling therewith, either vessels on the water, or carriages on the land, and that the following is a full and exact description thereof.

One object of my improvement is to substitute for the crank motion a mode of converting the reciprocating motion of a piston into a continued rotary motion, by a new combination of machinery for that purpose. This mode is applicable to an engine either with one or two cylinders, and is carried into effect as follows:—Along side of the cylinder I place a shaft, the lower end of which may revolve in a step on the platform, or foundation upon which the cylinder stands; in which case it must be somewhat longer than twice the length of the cylinder, as it must extend above it to a height somewhat greater than the length of the stroke of the piston. Sometimes, however, this shaft may have its lower gudgeon only a small distance below the upper end of the cylinder, whence it must extend above it, as before. Its upper gudgeon must, of course, be sustained by a suitable frame. This shaft is to stand parallel to the piston rod, from which it is to receive its revolving motion. Upon the upper end of this shaft, above the top of the cylinder, there is to be placed a solid cylinder of wood, or of any other convenient substance, of such diameter as shall cause its periphery to come nearly into contact with the piston rod, for its whole length, when the piston is raised.

The solid cylinder, above described, is to be made to revolve in the following manner: I make a groove in it which commences in its lower end, and passing spirally, extends half way round it by the time it reaches nearly to the upper end, or to a distance, vertically, equal to the stroke of the engine; from that point it passes down, around the opposite half, and returns into itself at the point of beginning. Upon the upper end of the piston, against its side, I place a friction roller, which is to work in the groove in the solid cylinder, the piston rod rising between parallel guide pieces, by which it is kept in its proper place, and its tendency to turn round by the action of the roller in the groove is checked. When the piston is down, this friction roller will stand in the V formed junction of the grooves on the opposite sides, and as it is raised, it will, in its passage to the upper junction, give half a revolution to the solid cylinder, and in descend-

ing, will complete the revolution by the action of the friction roller on the other portion of the groove.

When two steam cylinders are used, they are to be placed parallel to each other, and at such distance apart that the pistons of each may in like manner act upon the solid cylinder, the piston of one being up, when the other is down. The boiler, the steam pipe, the valves for the admission and discharge of steam, and other appendages, may be similar to some of those already in use.

From the revolving shaft, already described, a rotary motion may becommunicated to paddle wheels, steam carriages, or other objects. As it is my intention, in general, to place my cylinders and revolving shaft vertically, I communicate motion to the horizontal shaft of a paddle wheel by means of bevel geared wheels near the lower end, or at any convenient part of the shaft; and by similar gearing, carriages may be propelled upon rail, or ordinary roads.

When used for steam-boats, I employ an improved spiral paddle wheel, differing essentially from those which have heretofore been essayed. This spiral I make, by taking a piece of metal, of such length as I intend the spiral propeller to be, and of a suitable width, say, for example, eighteen inches; this I bend along the centre, so as to form two sides, say of nine inches in width, standing at right angles, or nearly so, to each other, and give to it, longitudinally, the spiral curvature which I wish. Of these pieces I prepare two, three, or more, and fix them on to the outer end of the paddle shaft, by means of arms of a suitable length, say of two feet, more or less, in such a position that the trough form given to them longitudinally, shall be effective in acting upon the water. It must be entirely under water, and operate in the direction of the boat's way. Instead of metal, the spiral propeller may be formed of wood, worked into the proper form; the shape, and not the material thereof, being the only point of importance.

Where a capstan is required, as on board of a steam-boat, I allow the upper end of the vertical shaft before described, to pass up through the deck of the vessel, and attach the capstan thereto, so that it may be made to revolve by the action of the shaft, using such rag wheels and palls to connect the shaft and the capstan, as will allow of their being conveniently engaged and disengaged.

What I claim as my invention, and for which I ask a patent, is the substituting for the crank, in the reciprocating engine, a grooved cylinder, operating in the manner hereinbefore described, by means of the piston rod; together with all the variations of which this principle is susceptible. As, for example, a bar of metal may be bent in the form of the groove, and attached to the revolving shaft, and friction wheels on the piston rod may embrace this on each side, producing an effect similar to that produced by the groove.

I also claim the spiral propelling wheel, constructed and operating in the manner which I have set forth; and likewise the application of the revolving vertical shaft to the turning of a capstan on the deck of a vessel. Not intending, in either of these parts, to confine myself to precise forms or dimensions, but to vary them in such manner as

experience or convenience may dictate, whilst the principle of action remains unchanged, and similar results are produced by similar means.

JOHN B. EMERSON.

Specification of a patent for improvements in the mode of constructing and combining bells for horses. JASON BARTON, *Cairo, Greene county, New York, March* 18, 1834.

To all whom it may concern, be it known, that I, Jason Barton, of Cairo, in the county of Greene, and state of New York, have invented an improvement in the mode of constructing and combining bells, in such a way that two, four, or a greater number, may be struck by a single tongue, clapper, or hammer, at the same time; which combined bells are intended to be attached to the ames, or other parts of harness for horses; and which may also be advantageously used in military and other bands of music, in the place of triangles, and other instruments which are employed for a similar purpose. And I do hereby declare that the following is a full and exact description of my said invention.

Although more than four bells may be combined together upon my plan, I will, for the sake of facility in description, suppose that to be the number employed. I cast two bells, of any suitable metal, or mixture of metals, each of which bells is to be hemispherical, or in such form that when their edges are made to approach each other within half an inch, their outline will be a sphere, say of four inches in diameter; these bells are to have holes in their centres, like ordinary clock bells, for the purpose of attaching them together. This, it is evident, might be done by a straight rod of metal, with suitable screws and nuts; but instead of this, I make a ring, or hoop, somewhat less in diameter than the inside of the bells, and from the periphery of this, on opposite sides, project two spurs, or pins, which pass through the holes in the bells, and are attached to them by nuts.

I then take two other bells of a larger size, say of five inches in diameter, and in the same hemispherical form. These are to surround the others, and are attached to the same ring; for this purpose, two other spurs, or pins, project from the ring, midway between those first named, and passing through the space between the first pair of bells, serve by screws and nuts to secure the outer pair concentric with them. A pin, or piece of metal, projects from the interior of each of the bells, pointing towards their centres, for the hammer to strike against. Those on the two outer bells pass through the space left between the inner ones, and those on the inner bells are as close as may be to them, so that they all terminate near enough to each other, and are of such length, that they will receive the blow at the same time. These pins may be cast of the same metal with the bells, or pins of hard iron or steel, tinned and laid in the mould, may be used, should it be found that the others have a tendency to batter up.

The tongue, clapper, or hammer, which is to strike these pins, stands in the middle of the hoop, or ring, within the inner bells, where it is hung by means of a spiral coil of steel or iron wire, attached by

one end to the ring, and by the other to the hammer, which may be in the form of a flat disk of metal, of such thickness as will give it sufficient weight. When so fixed, a slight agitation will bring it into contact with the four projecting pins upon the peripheries of the bells. The outer bells may approach each other very nearly, say within one-fourth of an inch; and the whole may be of any size desired.

The two spurs, or pins, by which the outer bells are fastened, serve also to receive the bale, or ring, which is to serve as a support for the apparatus, and by which it is to be attached to the ames, or wherever else it is intended to be used.

What I claim as my invention, is the combining together any convenient number of hemispherical bells, concentrically, and placing within them, a single hammer, or clapper, which may strike the whole at once, whether the same be arranged precisely in the manner here described, or in any other in which the same principle obtains, and a similar effect is produced. JASON BARTON.

Specification of a patent for Hulling and Cleaning Clover Seed, and for other purposes. Granted to DAVID RANKIN, *Augusta county, Virginia, March* 18, 1834.

To all whom it may concern, be it known, that I, David Rankin, of the county of Augusta, in the state of Virginia, have invented an improved machine for the hulling and cleaning of clover seed, and which may also be used for the cracking or breaking of corn, for hominy, or for horse feed; and I do hereby declare that the following is a full and exact description thereof.

The part of the apparatus which is employed to hull the seed, consists of a hollow frustrum of a cone, having a conical nut revolving within it, both made of cast iron, fluted, in the manner of many mills used for grinding bark, corn, and other substances. The axis of the conical nut, or runner, is placed horizontally, and there is an opening made on the upper side of the shell, or hollow cone, towards its smaller end, through which the seed is to be fed. This is surmounted by a hopper, and the hulled seed and chaff escape at the larger end of the cone, whence they fall upon a double, inclined, sieve, or riddle; the meshes of the upper sieve separating the grosser portions of the chaff; and those of the lower allowing the seed and dust only to pass through, which, as they fall, are operated upon by a fan wheel, and the cleaning thus effected.

The nut, or runner, I cast in segments, dividing the whole circumference thereof into five or six parts; these I unite together by means of suitable heads, to which they may be attached by screws, or otherwise; or the segments may be fastened on to a cone of wood, or united in any other way which shall allow the passing an axis through the centre of the cone.

On the axis at the smaller end of the cone I place a whirl, and below this a wheel, turned by a crank, a band from which passes round the whirl; or, if preferred, a wheel and pinion may be substituted for

the whirl and band. The shaft of the wind wheel, or fan, which is at right angles to that of the nut, is also turned by a band from the crank wheel, which is conducted round to a whirl or pulley upon its end, by means of friction pulleys on one corner of the frame. I employ tightening, or regulating screws, one at each end of the shaft of the runner; and by means of these I can regulate the feed in the most perfect manner, causing the conical runner to approach nearer to, or to recede from, the hollow cone, as may be found requisite; the gudgeons having a longitudinal play for that purpose.

What I claim as my invention, and for which I ask a patent, is the application of the conical cast iron nut and shell, constructed and arranged in the manner herein described, for the purpose of hulling clover, and other similar seeds; and the general combination of the whole, for producing the intended effect; not meaning thereby to claim the screens, the fan, or other well known parts of similar machines, as making any part of my invention, but only that particular combination of them which I have adopted.

DAVID RANKIN.

Specification of a patent for an improved Cooking Stove. Granted to ELISHA D. PAYNE, *city of New York, March* 8, 1834.

To all to whom these presents shall come, be it known, that I, Elisha D. Payne, of the city of New York, have invented an improved stove for cooking, and the principle of which is applicable to other purposes, which I denominate the revolving and sliding furnace stove; and I do hereby declare that the following is a full and exact description thereof.

I intend, in general, to make the body of this stove circular, and to fix the fireplace, or furnace, in such a manner as that it shall be capable of revolving with the plate which forms the lower part of the heat chamber of the stove. Sometimes, however, it may be found convenient to make the stove rectangular, and to shift the lower plate of the heat chamber by a sliding, instead of a revolving, motion; both of which modifications I will describe, commencing with that in the circular form, which I deem the best.

This stove may be made of any size which may be desired, and the proportion of its respective parts varied, as experience, or convenience may dictate; I do not, therefore, by any dimensions which I may give, intend to limit myself in this particular, but merely to assume such dimensions for convenience in description; and although I shall suppose most of the parts to be made of cast iron, I intend to use any material which may be adapted to the purpose.

The upper plate of the stove is to have a hole in the centre of it, surmounted by a tube, or neck, to receive the pipe by which the smoke and heated air are to be discharged; and near its periphery there are to be openings to receive stew pans, pots, kettles, bake irons, or other cooking utensils. From this upper plate, descends a cylindrical rim, from one to four, or more, inches in width; and on the lower edge of this rim there is to be a flanch, or bearing pieces, upon which the

lower circular plate is to rest, and to be capable of revolving; this plate, or circular disk, is to fit nicely within the cylindrical rim before described; and the space between it and the upper plate constitutes the heat chamber, and the vent for smoke, through the centre opening.

When the stove is large, the lower revolving plate may be sustained upon friction rollers; and it should be furnished with a circular rack, extending round it, near to its outer edge, into the teeth of which, a pinion, turned by a crank, is to match, for the purpose of turning it. The stove may stand upon legs descending from its rim, one of which legs will serve as a support for the pinion; it may, however, be suspended by iron rods from the ceiling; and the legs be thus dispensed with. When of moderate size, the lower plate may be turned by a lever without the aid of a rack and pinion.

The furnace, or grate, for containing the fuel, is attached to, and descends below, the revolving plate, immediately under the openings left in the upper plate, for the reception of cooking utensils. The fuel may be of any kind, and may be supplied through a door made for that purpose, in the outer side of the furnace; or it may be passed through one of the openings in the upper plate. The box, or chamber, of the furnace, may be made close, or may have bars at one or more sides of it, for the purpose of roasting before an open fire.

Concentric with the outer rim of the heat chamber, I usually place a second rim, or hoop, which is of such width as to occupy the space between the upper and the lower plate, but not fitting against them so tightly, as to prevent its revolving, in the manner to be described. This hoop, or rim, I do not make a complete circle, but leave an opening in it sufficiently large to admit the smoke and heated air to escape through into the smoke pipe. This opening may be equal to one-eighth of the circle, more or less, according to circumstances; and the diameter of the rim need be but little more than that of the pipe, the opening into which it surrounds.

To cause the heated air from the furnace to pass round in the heat chamber, instead of escaping directly into the pipe, I place valves, or registers, within the chamber, extending from the exterior to the interior rim, in a radial direction, and between the openings in the upper plate, which, when closed, may be made to direct or confine the current, as desired. Of these valves, or registers, there may be any number, although, in many cases, one or two will answer the purpose. The interior hoop, or rim, is to be made to revolve independently of the lower plate, which may be managed in various ways: that which I prefer is the following:—I pass a vertical shaft up through the centre of the lower plate, which shaft rests upon a suitable step at its lower end, its upper end being received in a cross bar left in the upper plate, at the opening for the stove pipe. This shaft, within the chamber, may be made square, and pass through a square hole in the middle of a bar, or of horizontal arms attached to the revolving rim within the heat chamber; this affords the means of giving to the opening into the pipe, any position which may be desired. A lever, or handle, projecting from the shaft, below the lower plate, will, if standing immediately under, or in any known relative position to that

opening, serve to determine its situation. A shoulder, or projecting collar, should be left on the vertical shaft, to come in contact with, and to support, the lower plate.

The same general principle of shifting the furnace, may be applied to a stove of a rectangular form. In this case, the lower plate, instead of revolving, is to be made to slide longitudinally; the heat chamber being formed by an upper plate, and sides of a suitable depth. The lower plate must, in this case, be made twice as long as the heat chamber, and the furnace must descend from its middle part. The lower plate may be made to traverse backward and forward by means of a rack and pinion on its lower side. Any required number of openings may be made in the upper plate, for cooking utensils, or other purposes.

What I claim as my invention, and for which I ask a patent, is the constructing of a cooking stove, evaporating furnace, or other apparatus, for the management and distribution of heat, upon the principle herein set forth; that is to say, in which the plate to which the furnace is attached, has a revolving or a sliding motion, allowing it to be shifted from one part to another of the heat chamber, whilst the heated air is directed in its course by valves, or dampers; or confined by them within any required limits; whether the same be effected exactly in the way herein described, or in any other operating upon the same principle, and producing similar results.

ELISHA D. PAYNE.

Specification of a patent for improvements in the Apparatus for Spinning Cotton, or other Fibrous Substances. Granted to ASAEL L. LANPHER, *Killingly, Windham county, Connecticut, March* 19, 1834.

To all whom it may concern, be it known, that I, Asael L. Lanpher, of Killingly, in the county of Windham, and state of Connecticut, have invented an improvement on the apparatus for spinning cotton and other fibrous substances, which is intended as an improvement on the machinery patented by John Thorp, in which he applied the hook and ring to that purpose, and I do hereby declare that the following is a full and exact description thereof.

I make the rings, usually, of wrought iron, and case harden them, or of steel. A ring three and a half inches in diameter, I find most suitable for making twisted roving; two grooves turned near its top edge, one on the outside, and the other within, serve to retain the traveller in its place; they may be one-eighth of an inch in depth. The traveller may be made of iron or steel wire, and should be hardened. The wire may be cut into lengths of about three-fourths of an inch, and so bent that the ends shall be about three-sixteenths of an inch apart. To introduce the traveller, the upper edge of the ring is notched through, a piece being fitted in, which is fastened by a pin when the traveller is in its place.

The ring is sustained in its place, with the spindle in its centre, by

means of three or more small friction wheels, the edges of which pass into a groove turned near its lower side; and it is made to revolve by a band working in another groove, intermediate between the two named. The spindles rise and fall within it in the usual way.

Instead of a mere guide wire between the spindle and the front rollers, I place a tube of about two inches in length, and half an inch in diameter; this tube has a hole of about one-fourth of an inch in diameter, leading from its upper, nearly to its lower end, where it turns, and comes out at the side. A piece of iron or steel projects from the lower end, in a line with the axis of the tube, the extremity of this piece being bent in the manner of the end of a common flier, or otherwise so formed as to embrace the thread. The object of this is to hold and guide the roving, or thread, after it passes through the tube, in order to throw the twist up towards the front rollers, and thus give the roving strength, that it may bear a high speed. The tubes have whirls on them, and may be driven by a band from the cylinder or pulley placed at the end of the frame, or otherwise.

I start the ring with the spindle, in order to prevent the breaking down of the roving after doffing; and as the bobbins increase in size, the traveller increases its movement, giving a gradual draft; and in order to give an uniform twist to the roving, from end to end, I graduate it by accelerating the motion of the rollers as the bobbins fill, or I decrease the speed of the spindles.

In operating with this improved apparatus, the tube is driven at any speed that is required to run in a twist up to the point where the roping comes through the rollers, that it may be strengthened where it is most liable to break.

The twist comes out as it leaves the end of the flier-formed projection, and whatever may be requisite is given by running the ring and the spindle at the relative velocities which may be necessary to accomplish this end; a point which every machinist can easily regulate.

What I claim as my invention, and improvement, is the tube, or counter-flier, applied upon the principle herein set forth, for the purpose of making twisted and condensed rovings. I also claim the manner of fixing the ring, and keeping it in its place by friction wheels; and the general combination and arrangement of the parts described, in order to attain the ends proposed. Not intending to limit myself to the dimensions given, or to the precise mode of constructing the respective parts, but to vary the same as I may think proper, whilst I accomplish the same object by analogous means.

ASAEL L. LANPHER.

Description of an improvement in the art of fastening together the Planks or Boards of a Vessel's or Boat's Bottom, Sides, or Deck; for which a patent was granted to THOMAS BLANCHARD, *city of New York, March* 20, 1834.

After laying the keel, and fixing the stem and stern posts, rods or bars of metal are placed upon the top of the keel, and fastened to it

by their middles, their ends being bent up in the form of ribs to the boat intended to be built, their ends reaching up a little higher than the place of the gunwale. The rods are perfectly secured in their places by the keelson, which crosses the whole of them. The rods are to be slightly attached to a spiling at their upper ends, to confine them so as to give the proper form of the boat.

The planks are to be cut and fitted in the usual way, but so as to form perfect joints, and are placed against the outside of said rods, which may be imbedded in, or merely rest against, them. Near each edge of each plank is firmly attached a clamp, passing over the rods; these clamps may be made of hoop iron, or otherwise. All the planks are thus fixed excepting those for the wales, which, being thicker than the others, are to be bored through to receive the rounded and tapped ends of the metallic ribs, which have screw nuts, the tightening of which upon the gunwale, will draw all the planks together, in the most perfect manner. Dowel pins may be employed in the edges of the plank to prevent slipping.

Thwarts are placed at the usual height, and properly fitted and supported by cleets. Under each thwart a metallic rod crosses the boat, passing through its sides, and serving to draw them close to the thwarts, and thus to prevent all danger of spreading.

The mode of securing the deck by similar means, and of fixing diagonal or other braces, are fully explained, but these not affecting the general principle, we do not deem it necessary to particularize. It is manifest that futtocks, knees, and other known modes of giving stability, may be added to the particular device of the patentee.

When the planks are sufficiently thick, they may be bored through edgewise, and the rods passed through them; or the rods, flattened, may be passed around the plank on the outside, instead of within, in either of which cases the clamps, above spoken of, will be dispensed with. Elastic wood may also be substituted for the metal rods, and made to act upon the same principle with them.

"The principle of this improvement consists in the simultaneous action and continued force of mechanical means upon the edges of the planks or boards of a ship's, or vessel's, or boat's bottom, and sides, and deck as aforesaid, the edges of said planks or boards being cut to the form or curvature intended, so that the mechanical force used will act fairly and equally on the surface of said edges, and on the planks or boards, to press the edges closely together, and draw the planks or boards inwards by the same operation, substantially in the mode herein first above described, in respect to the fastening of the bottom and sides, and decks of vessels respectively."

We will not dismiss this description without saying that the plan appears to us to be not only a real, but a great improvement in the fastening the planking of vessels, but particularly of boats and others of the former class, for which it appears to be specially intended.

Specification of a patent for an improvement in Lamps. Granted to Jacob Keim, *city of Philadelphia, March* 29, 1834.

To all whom it may concern, be it known, that I, Jacob Keim, of the city of Philadelphia, in the state of Pennsylvania, have invented an improvement in lamps, and that the following is a full and exact description thereof.

The lamp in which my improvements are applied is of that kind which has a circular wick, with a glass chimney, or Argand's burner; and it may be either suspended, or fixed upon a stand; the reservoir for oil is to be constructed in the same manner as is usual in lamps of that description, the improvements consisting principally in the formation and arrangement of the tubes for containing the wick, and supplying air thereto; the latter of which objects is effected by currents from the bottom, through the body of the lamp, not only for that portion which is required on the inside, but also for that which is necessary on the outside of the flame. The drip-cup screws on in the usual way, and is perforated with holes, to supply air through the inner, or spiral tube. On the outside of the concentric tubes which contain the wick and the runner, there is another tube extending through the body of the lamp, from the top to the bottom, and open at both ends; and through this the air is supplied to the outside of the flame, a circular space of three-sixteenths of an inch, more or less, being left for that purpose. The lower end of this tube is firmly soldered to the body of the reservoir, the oil from which has a passage into the space between the tube forming the chamber for the wick, through two or three small tubes leading from one to the other, and situated as near as may be to the lower end thereof; these small tubes serve also to sustain those forming the chamber for the wick, in their places, no other stays or supports being necessary.

The runner, or loose tube which surrounds the wick, and which has a slot in it for guiding the wick holder, in the usual way, I line, or cover, with flannel, or some other kind of cloth; this I usually fasten thereto by sewing it through holes drilled in the runner for that purpose. When it is to be sewed on the inside, the tube forming the runner must, of course, be made sufficiently large to admit it without its interfering with the raising of the wick. This lining, or covering, is to extend the whole length of the runner; its use is to serve not only as a filterer of the oil as it rises to the wick, but principally, by its capillary attraction, to carry this fluid up to the wick when the latter is high up in its chamber, and the former low in its reservoir; a purpose which it answers so effectually that the whole of the oil may be burnt, although it may be far below the level of the wick.

By this arrangement I am enabled to elevate the upper edge of the wick considerably above the body of the lamp, and thereby to lessen its shadow to a considerable extent.

An opening may be made in the upper part of the reservoir, for supplying it with oil; but instead of this I generally give to it a cylindrical form, the cylindrical part rising to the height of an inch, more or less, above the body of the reservoir, and terminating on the same level with the tubes which form the passage for air to the outside of

the flame, and at such distance therefrom as to leave a space between it and the outer of these tubes, of sufficient width to pour in the oil.

The glass holder, which also raises the wick, has perforations on its upper surface, just over the outer air tube, to feed the flame.

What I claim as my invention, and for which I ask a patent, is the general construction and arrangement of the parts of the within described lamp, for the purposes herein set forth, and especially for that of giving a clear and continuous supply of oil to the wick. The reservoir for the oil, the spiral tube for raising the wick, the wick holder, and the drip-cup, being common to this and to many other lamps, make no part of my invention or improvement, but in all other respects I consider this lamp as essentially new, inasmuch as by the combination of its parts, as described, new and useful effects are produced.

JACOB KEIM.

Specification of a patent for Stoves for Cooking and other purposes. Granted to JOHN HARRIMAN, *of Haverill, Essex county, Massachusetts, March* 31, 1834.

To all whom it may concern, be it known, that I, John Harriman, of Haverill, in the county of Essex, and state of Massachusetts, have invented certain improvements in the manner of constructing stoves for cooking and for other purposes, and that the following is a full and exact description thereof.

The principal part of the body of this stove is to be made of cast iron. The bottom plate forms the lap, the bottom of the fireplace, and of an oven situated behind it. The fireplace is like that in many other stoves, being a deep opening, and having double doors in front, which may be closed when requisite. In the upper plate of the fireplace I usually make three perforations for the reception of cooking utensils, the middle one large, and furnished with concentric circular rings of different sizes to adapt it to different kinds of vessels. Near to the back end of this plate I make two other openings, which may be either round or oval; and to give sufficient room for these I swell out the said top plate, and also the side plates of the fireplace, giving to it a curved form which is at the same time both ornamental and convenient. There may, if desired, be other openings in the top, but these are all that I deem essential.

The oven is situated behind the fireplace, and is in the form of a rectangular box, one side of which is against the back of the stove. The oven has a door, or doors, at one end, and it is formed with outer plates of cast iron, and inner plates of sheet iron. This latter part is made in a separate and distinct box, so that it can be drawn out whenever it requires to be repaired, or renewed. It is made so much smaller than the outer box as to admit a space between the top, bottom, and sides, through which the heated air and smoke are to pass in their passage to the pipe. These escape from the fire through a throat, or opening in the upper part of the stove back, and then pass down, and under the oven, thence ascending to the top, where there is an opening for a stove pipe. This opening is surrounded by a partition

on the top of the oven, to prevent the heated air from passing over it, without going down and around it; in this partition there are valves which may be opened when it is wished to direct any part of the current over the oven. I intend sometimes to cover the top of the inner portion of the oven with a cast iron plate, should the intensity of the heat render it necessary.

Instead of making round openings directly through the top plate of the oven, for receiving cooking apparatus, I make a rectangular opening, the length of which may be twice as great as its width, and adapt stew pans, frying pans, &c. to this opening. The plate which is to cover it when not wanted to be entirely open, I perforate so as to receive smaller cooking vessels, when required.

By this arrangement, boiling water for washing, for cooking meat by boiling, as well as roasting, baking, frying, and broiling, may all be carried on together, or any desired number of them may be performed separately.

What I claim as my invention, and wish to secure by letters patent, is the form given to the body of the stove for the purpose of receiving the two smaller openings for vessels near its back and two sides; the making the rectangular opening in the outer top plate of the oven in the manner and for the purposes set forth; the making the inner sheet iron oven so as to draw out; and the particular arrangement of the parts, for attaining these ends.

John Harriman.

Specification of a patent for Machinery for Boring and Mortising Hubs for Wheels. Granted to Robert M'Carty, *Martinsburg, Lewis county, New York, March* 31, 1834.

To all whom it may concern, be it known, that I, Robert M'Carty, of the town of Martinsburg, in the county of Lewis, and state of New York, have invented new and useful machinery for boring and mortising hubs for wheels, as well as other articles; for cutting out and dressing the felloes and spokes in the business of manufacturing carriage wheels of all descriptions; and which are applicable to many other branches of business in which similar operations are to be performed; a part of which apparatus also may be applied to the shifting and setting of the logs in saw mills, and for other purposes; and I do hereby declare that the following is a full and exact description thereof.

That part of the machinery which is to perform the boring and mortising has a carriage somewhat like that of a saw mill, but only of such length as is necessary to receive the hub or other article to be operated upon; and this carriage traverses backward and forward, in like manner, upon suitable ways. A frame to rise and fall vertically, like a saw frame, is worked up and down between fender posts, by means of a lever, and a shaft in the middle of this frame, fixed vertically, has a socket in its lower end to receive chisels, or boring bits of various kinds. This shaft may be made to revolve by a band passing round a whirl, when wanted for boring, or may be fixed by a

screw or wedge when used for mortising. The frame and shaft, and also the fender, or guide parts, I usually make of cast iron.

When a hub is to be bored and mortised, it is fixed between two heads attached to the carriage, and held in its place by a screw, or slide, much in the manner of an article to be turned in a lathe. The screw has upon its end a box, or chuck, which receives one end of the hub, and which serves, by means of divisions upon its periphery, to lay out the mortises. This box, or chuck, is hollow, and has within it a spiral spring which is wound up by turning the screw, so that by raising the point which falls into the divisions on the periphery, the tension of the spring will cause the box and hub to turn until the point falls into the next division; the hub, or other article, may thus be bored, and afterwards mortised all round, without the trouble of laying out the mortises. In boring, the bit is regularly brought down by the lever; in mortising, the lever is worked up and down like a pump handle, and by this motion the hub also is moved regularly backwards and forwards under the chisel, until the mortise is completed.

The manner in which the carriage is moved, I will now describe. There is a cam, or projecting piece, on one side of the frame which carries the boring and mortising shaft; which cam operates upon the upper end of a vertical lever, working upon a pin, or fulcrum, which passes through it into one of the fender posts. This lever acts upon two ratchets, one attached to it above, and the other below its fulcrum, which operate upon ratchet, or rag wheels, at opposite sides of the fender posts, something like the feed hand of a saw mill; these being alternately brought into operation, serve to reverse the motion of the carriage, which is driven by means of pinions upon their axes, that take into racks upon the carriage. The carriage, by means of cams, or lifters, raises one of these ratchets, and depresses the other, at the required point. The parts by which this is effected may be variously arranged; that, however, which I prefer, is represented in the drawing deposited in the patent office, and is explained by the written references thereunto annexed.

One of the chisels which I use for mortising is a square socket chisel, with four cutting sides, the chips passing up through the inside or socket part of it, and being delivered at an opening, or throat, on one side. The two sides which head the mortise have cutting edges at their angles which descend below the general edge; and the socket part enlarges above the bevil of the chisel, to free and hold the chips as they pass up.

For tenoning the spokes, I use a double chisel, cutting the sides and shoulders at one operation, one part of the cutting edge of each being at right angles to the other. These chisels are screwed, or otherwise fastened together, so that their distances from each other may be altered to suit the thickness of the tenon. The combined chisels fit by their shanks into the socket before alluded to.

To get out and to dress the felloes, I employ a cast iron wheel revolving on a mandril, or shaft, fixed in its centre, on the opposite side of which I place cutters, upon sliding arms, which may be set to the proper radius, and distance apart, for wheels of different sizes,

and felloes of different widths. Such a table, when not too large, may be fitted into, and revolve with, the shaft of the machine, with the cutters on its under side; or it may be fixed in a separate frame. To an arm on the same table I affix a plane which dresses the sides of the felloes. Instead of a wheel, arms extending out may answer the same purpose.

What I claim as my invention is the particular construction of the square socket chisel for mortising; the adjustable chisels for tenoning; the application of the spring in the index head, for shifting the hub; and the general arrangement of the whole machine as described, to effect the purposes herein set forth.

ROBERT M'CARTY.

ON THE MANUFACTURE OF VARNISHES.

(Continued from p. 215.)

Japanners' Gold Size.

It is most proper to make gold size in iron pots, as, from the great heat and the quantity of driers required, copper pots are too thin and ductile; they would soon become quite burned at the bottom. Therefore, to make forty gallons of gold size, put ten gallons of oil into the set iron pot, Fig. 1, make a good fire under it, and boil it for two hours; then introduce seven pounds of dry red lead, seven pounds of litharge, and three pounds of copperas, by sprinkling in a little at a time; let the oil keep boiling all the time, not in too great a heat, or it will perhaps run over. During the time of putting in the driers, keep stirring them from the bottom of the pot; for should they settle in a mass, before the oil has gradually taken them up, it will darken the gold size; therefore, keep constantly stirring, and have the large iron ladle ready to cool it down, if it should appear to rise too high; have also at hand an empty pot—the copper boiling pot will do—into which immediately lade part of the boiling oil, if it cannot otherwise be kept in the pot, while the assistant is either choking or damping the fire with wet sifted ashes, of which there always ought to be a wheelbarrowful at hand, in case of an accident; but of which there need not be any fear, if due precaution is observed. It is better to be a little under the heat than above it, particularly by those who are not experienced makers; it will only require a little longer boiling, to make up for the deficiency of heat. When the oil has boiled about three hours from the beginning, and the driers are all in, fuse in the gum-pot ten pounds of gum anime; and during the time of fusing, heat two gallons of raw linseed oil in the copper pouring jack, by placing it on the plate of the gum furnace. After the oil has been poured to the gum, and as soon as, on examination, it appears boiled clear, take the gum-pot from the fire; let it cool for a few minutes, then pour it into the oil in the set-pot. Wash out the gum-pot, and proceed with another run in the same way.

When both runs of gum are in the set-pot, there are altogether fourteen gallons of oil, twenty pounds of gum, and seventeen pounds

of driers; increase and keep up a regular fire in the front of the furnace, that it may be drawn out in a moment, if it should be necessary. The gold size will soon throw up a frothy head on the surface, which must be kept down by constantly plying with the ladle when it is likely to rise within four inches of the pot edge. In about five hours from the beginning of the oil boiling, it will become stringy; but the boiling must continue until it hangs to the ladle, appears quite stringy, yet drops in lumps. When tried upon the glass, if it feels sticky and strings strongly, then it is boiled enough. Draw out the fire, sprinkle it with plenty of water; leave not a spark of fire in the varnish house—not even a lighted pipe of tobacco. While the maker is cooling down the pot, let the assistant have ready at the door thirty gallons of turpentine, fill the pouring-pot ready, and have all the doors open. Endeavour to cool it as fast as possible, as it will require at the least one hour and a quarter after the fire has been put out before it will be ready to mix, because the pot being iron, and very thick, and set in bricks, causes the gold size to hold heat a long time, therefore it is difficult to describe exactly at what time to mix the turpentine; for, observe, that if the oil and gum are not sufficiently boiled, the gold size will perhaps not dry quick enough; and if they should, on the other hand, be too strongly boiled before they are cold enough to mix, even though the fire be out, they may become what is termed coagulated or slimy, and be so much concentrated that their particles will not open with the turpentine, and the whole becomes completely lost; so that it is better to err on the safe side, and stop the boiling in time. When the mixing commences, continue the pouring without intermission, until all the froth at the surface disappears, never stirring it until the turpentine is all in. If pouring in the turpentine has commenced while it was too hot, there will be a great loss of turpentine by evaporation; but that will not injure the quality of the gold size.

Place the carrying-tin close to the side of the pot, lay on the tin ladle, and strain off as quickly as possible. When all the gold size is out, pour into the set-pot about three gallons of turpentine washings, and, with the swish, wash down the pot as quick as possible; and if the pot is still so hot as to evaporate the turpentine, lade it out into the washings again, and pour in about three gallons of raw linseed oil, and with a palette-knife scrape it all round, washing and cleaning it down with a rag until it is quite cleansed all round; then lade out the oil, and wipe it completely clean and dry. The gold size ought to dry in from fifteen to twenty-five minutes, and in fourteen days it is ready for use. Experienced makers can make gold size that will dry in five minutes, but that requires great practice.

Black Japan, (the best,)

Is made after the manner of the gold size. Put six gallons of raw linseed oil into the set-pot; boil it with a very slow fire. Have a ten gallon cast iron pot, with two handles or ears; this pot will fit into the plate of the boiling furnace, Fig. 2; into which put ten pounds of Egyptian asphaltum, and make a good fire in the furnace: it will require a good regular fire all the time of fusion. There ought to be

an iron cover exactly to fit the fusing-pot; and also a pair of pot-hooks for lifting it from the fire; for sometimes, if the pot is thin and the fire too brisk, it requires lifting from the fire a few minutes to moderate the heat. During the time the asphaltum is fusing, have two gallons of oil getting hot to mix it with as soon as it is sufficiently melted. After it is oiled, leave it on the fire about ten minutes; then either lift it by the pot-hooks, and pour it into the set-pot, or otherwise empty it with a ladle; whichever way it is emptied, leave the stones, &c. at the bottom. Carry it out of doors, and with a handful of hay or straw clear it out, and afterwards wash it out with turpentine washings, and dry it with a rag. Proceed and finish three more separate runs like the first, until there are four runs in the set-pot, that is, forty pounds of asphaltum and fourteen gallons of raw linseed oil; then introduce exactly the same driers as for the gold size, and in the same manner. Keep a regular, but moderate fire, so that the boiling continues at a moderate heat for four hours from the last run being poured in the set-pot; then draw, and put out the fire for that day. Next morning, as soon as it can be brought to a boil, try it upon a bit of glass; if it but strings strongly, it will not do: it must be boiled so strong, that when a piece is pinched from off the glass, after it has been left to cool, it will roll in a hard pill between the finger and thumb. When it forms hard, and scarcely sticks to the fingers, it is then boiled enough. Put out the fire, as directed before. Leave it one hour and a half before mixing. When cold enough, mix it with thirty gallons, at least, of turpentine, and strain it. If it is too thick when cold, heat and introduce as much turpentine as will bring it to a proper consistency. The japan will dry in six hours in summer, and eight in winter. It is principally intended for, and used by, coach-makers, japanners, painters, &c., and should be kept at least six months before it is used.

Another Black Japan

Is made by putting into the set-pot forty-eight pounds of Naples, or any other of the foreign asphaltums (except the Egyptian;) as soon as it is melted, pour in ten gallons of raw linseed oil. Keep a moderate fire, and fuse eight pounds of dark gum anime in the gum-pot; mix it with two gallons of hot oil, and pour it into the set-pot. Afterwards fuse ten pounds of dark, or sea, amber, in the ten-gallon iron pot; keep stirring it while fusing; and whenever it appears to be over heated, and rising too high in the pot, lift it from the fire for a few minutes. When it appears completely fused, pour in two gallons of hot oil, and pour it into the set-pot; continue the boiling for three hours longer, and during that time introduce the same quantity of driers as before directed; draw out the fire, and let it remain until morning; then boil it until it rolls hard, as before directed: leave it to cool, and afterwards mix with turpentine. This japan will appear in colour like the other; but when applied on work, it will dry more hard, compact, and glossy, and will not rub down or polish so soon as the other, which is occasioned by the toughness and durability of the amber.

Pale Amber Varnish.

Fuse six pounds of fine picked, very pale transparent amber in the gum-pot, and pour in two gallons of hot clarified oil. Boil it until it strings very strong. Mix with four gallons of turpentine. This will be as fine as body copal, will work very free, and flow well upon any work it is applied to; it becomes very hard, and is the most durable of all varnishes; it is very excellent to mix in copal varnishes, to give them a hard and durable quality. *Observe*, amber varnish will always require a long time before it is ready for polishing.

Best Brunswick Black.

In an iron pot, over a slow fire, boil forty-five pounds of foreign asphaltum for at least six hours, and during the same time boil in another iron pot six gallons of oil which has been previously boiled; during the boiling of the six gallons introduce six pounds of litharge gradually, and boil until it feels stringy between the fingers; then lade or pour it into the pot containing the boiling asphaltum. Let both boil until, upon trial, it will roll into hard pills; then let it cool, and mix it with twenty-five gallons of turpentine, or until it is of a proper consistence.

Iron-work Black.

Put forty-eight pounds of foreign asphaltum into an iron pot, and boil for four hours; during the first two hours introduce seven pounds of red lead, seven pounds of litharge, three pounds of dried copperas, and ten gallons of boiled oil; add one eight-pound run of dark gum, with two gallons of hot oil. After pouring the oil and gum, continue the boiling two hours, or until it will roll into hard pills like japan. When cool, thin it off with thirty gallons of turpentine, or until it is of a proper consistence. This varnish is intended for blacking the iron-work of coaches and other carriages, &c.

A cheap Brunswick Black.

Put twenty-eight pounds of common black pitch, and twenty-eight pounds of common asphaltum made from gas tar, into an iron pot; boil both for eight or ten hours, which will evaporate the gas and moisture; let it stand all night, and early next morning, as soon as it boils, put in eight gallons of boiled oil; then introduce gradually ten pounds of red lead, and ten pounds of litharge, and boil for three hours, or until it will roll very hard. When ready for mixing, introduce twenty gallons, or more, of turpentine, until of a proper consistence. This is intended for engineers, founders, ironmongers, &c.; it will dry in half an hour, or less, if properly boiled.

Another Cheap Brunswick Black.

Put twenty-eight pounds of common pitch and twenty-eight pounds of gas-asphaltum into an iron pot; boil these for eight or nine hours;

leave it until next morning; then bring it to a simmer, and gradually introduce seven pounds of red lead and seven pounds of litharge, and continue it at a low heat while the oil is got ready. Put five gallons of boiled oil into the ten-gallon iron pot, and boil it until it will blaze inside the pot when a lighted paper is held over it. As soon as it will catch fire, carry it out into the yard, put a ladle into the burning oil, and move it gently from the bottom. In about ten minutes from its catching fire, have the iron cover ready, and boldly, but deliberately, step forward and clap on the cover, taking care to fit it so tight to the pot, that it will extinguish the flame in a moment, which if it does not, lift the cover and try a second time, while the assistant throws the carpet over the cover, and holds it close for a minute; if that does not put out the flame, pour in cold boiled oil, of which there ought always to be two gallons in the pouring-jack ready at hand; then it will be easily extinguished by raising the cover. Continue setting it on fire and extinguishing it after the space of three or four minutes, until, when a little is poured into a muscle-shell and cooled, it looks as thick as treacle; it is then strong burnt oil. Before it is cool, lade it into the asphaltum, and boil the whole for two hours, or until it will roll hard. When sufficiently cool, pour in twenty gallons, or more, of turpentine until of a proper consistence. When this is properly managed, it may be made to dry in ten minutes.

Flock Gold Size.

Put twelve gallons of linseed oil into the iron set-pot; as soon as it has boiled two hours, introduce, gradually, twelve pounds of litharge. Continue the boiling very moderately for six hours; let it remain until next morning; then bring it to simmer, and run ten pounds of gum anime and two gallons of oil. When these two runs of gum are poured into the iron pot, put in seven pounds of Burgundy pitch, which soon melt, and continue the boiling, and keep lading it down, as before directed for the best gold size; boil it moderately strong, but not over strong; and when proper, mix it with thirty gallons of turpentine, or more if required; but recollect, this should be left a little thicker and stronger than japanners' gold size. This is intended for, and used by, paper stainers to lay their flock on, and ought to dry slowly in one hour.

Bronzing Gold Size

Is nothing more than japanners' gold size kept till very bright and tough from age, and then heated up and mixed with one gallon of very old carriage varnish to nine gallons of gold size. This is used by paper stainers for laying on bronze and also gold; and likewise by writers, grainers, japanners, gilders, &c.

Recollect, that the greater the proportion of carriage varnish, the slower it will dry. Some paper stainers like it to dry quicker than others; and writers and grainers like it to dry quicker than gilders and japanners.

Axioms observed in the Making of Copal Varnishes.

The more minutely the gum is run, or fused, the greater the quantity, and stronger the produce. The more regular and longer the boiling of the oil and gum together is continued, the more fluid or free the varnish will extend on whatever it is applied. When the mixture of oil and gum is too suddenly brought to string by too strong a heat, the varnish requires more than its just proportion of turpentine to thin it, whereby its oily and gummy quality is reduced, which renders it less durable; neither will it flow so well in laying on. The greater proportion of oil there is used in varnishes, the less they are liable to crack, because the tougher and softer they are. Increase the proportion of gum in varnishes the thicker the stratum, and the firmer they will set solid, and dry quick. When varnishes are quite new made, and must be sent out for use before they are of sufficient age, they must always be left thicker than if they were to be kept the proper age, as some of the annexed experiments will prove.

Exp. I.

Of two well got up pannels, painted with patent yellow, I varnished the first with good body varnish twelve months old, the second pannel was varnished with body of the like quality only one month old. After both pannels were dry, on examining the first it was excellent; but that varnished with the newly made varnish, looked poor, flat and *sleepy*, as it is termed.

Exp. II.

Of two pannels, both prepared and flatted down, the first I varnished with gold size, and the second with japan; both had only been made one month. The gold size dried in half an hour, and the japan in ten hours and twenty minutes. I then put both pannels into an empty drawer, where they remained for eight months. I then tried the same gold size and japan on two fresh pannels, prepared exactly as the first, when I found the gold size much thicker, yet much paler, and it now dried in fourteen minutes; the japan also dried now in seven hours.

Exp. III.

That varnish made from African copal alone, possesses the most elasticity and transparency, may be proved by the following facts. Three prepared pannels of a very pale straw colour, were all varnished in one day: the first with fine body varnish made from very pale gum anime; the second with fine body varnish made from one-half anime and one-half African copal; the third pannel was done with varnish made entirely from fine African copal. These three varnishes were all made with the greatest nicety for the experiment; all equal in their proportions and ages, having been all made in one day. At the time of varnishing the three pannels, the varnishes were all

eight months old. I filled three vials, one with each sort, and could discover no difference in the colour, either when held near to the eye or at a distance. Upon moving the vials, and turning them, the third, containing the African copal, appeared the most elastic. All the three pannels dried about the same time—eight hours. I hung them all three where they were exposed to sun, wind, and rain, for one month. I then examined them, and could perceive little, if any, difference in colour. I left them for another month, when, on examination, the first, made from anime, was the darkest, and that from the copal the palest. I then polished all three; the first polished very easily, the second not quite so easy, and the third was very difficult to polish, appeared very soft and clammy, but when completed was by far the palest and most transparent. I left them upon a roof exposed to the weather for three months, when I flatted them down a little, and varnished them afresh. In ten days after, I polished them, when the third, varnished with the African copal, was by far the palest, and looked like plate-glass.

Exp. IV.—*That too much Driers in Varnish renders it opaque, and unfit for delicate Colours.*

One day I varnished two pannels, got up and glazed with a very rich crimson lake. No. 1 was varnished with body varnish, made entirely from African copal, without any driers whatever, either in the clarified oil, or boiling. No. 2 was varnished with "body" of the same gum, age, and proportion, but with a small quantity of dried sugar of lead and dried white copperas. The pannel No. 1 dried in nine hours, and remained tacky for five hours more; the pannel No. 2 dried in seven hours without a tack. In a day after, both pannels were flatted down and varnished, and repeated until each pannel had four coats of varnish; the varnish was eight months old, and each dried in the same space of time. I hung both up for a month, and then polished them, and examined them with a microscope, when the pannel No. 1 appeared quite clear in colour, solid, and brilliant, like plate-glass; but No. 2 had changed a little in colour, inclining to purple, and in the varnish were almost imperceptible opaque points. I kept these two pannels for two years afterwards; when I examined them, there appeared no decay in No. 1, but in No. 2 the driers were perceptible on the surface with the naked eye.

[to be continued.]

On the Berlin Cast iron Ornaments. By Dr. Freidenberg.

In the Edinburg New Philosophical Journal for April, 1834, we find the following translation of an account of the celebrated cast-iron ornaments manufactured at Berlin, which has been given by Dr. Freidenberg in his German edition of Mr. Babbage's work on the Economy of Machinery and Manufactures.

The Berlin cast iron ornaments may be mentioned as an interesting

example of the increased value of manufactured, in comparison with the raw material; and we select this manufacture the more willingly, as it had its origin in Prussia; and though many attempts at imitation have been made, has never yet been equalled by any other country. In one of the principal manufactories of this description in Berlin, that of Devaranne, such is the fineness and delicacy of those separate arabesques, rosettes, medallions, &c. of which the larger ornaments are composed, that nearly ten thousand go to the pound. The price increases in proportion to the fineness, as will be seen by the following table, which gives the selling prices of the above named manufacturer.

	Number to the cwt.	Price of each article.			Price per cwt. of the same.		
		£	s.	d.	£	s.	d.
1. Buckles, 3½ inches long, and 2½ inches broad,.....	2640	0	2	6	330	0	0
2. Neck chains, 18 inches long, and 1 inch broad; and composed of 40 separate pieces,	2310	0	6	0	693	0	0
3. Bracelets, 7 inches long, and 2 inches broad; and composed of 72 pieces,.....	2090 pair	0	8	6	888	5	0
4. Diadems, 7¼ inches high, and 5¼ inches broad,.....	1100	0	16	6	907	10	0
5. *Sevigné needles*, 2½ inches long, and 1¼ inches broad; and composed of 11 parts,	9020	0	4	6	2029	10	0
6. Sevigné ear-rings, 3 inches long, and ⅞ of an inch broad; composed of 24 pieces,....	10,450 pair	0	5	3	2743	2	6
7. Shirt Buttons,.....	88,440	0	0	8	2948	0	0

If we reckon the price of the gray iron, from which these ornaments are made, at 6s. per cwt. on an average, we find that the value of the material is increased 1100 *times* in the *coarser* articles, and 9827 *times* in the *finest*.

The above are the retail prices, and the wholesale prices are probably one-sixth or one-eighth less: but we must remark, that, compared with the old prices, the present ones are much fallen. About six years ago they were twice as high, and twelve years ago three times; so that at that time Berlin cast-iron was nearly of equal value with gold,—a remarkable example, and perhaps one of the strongest proofs of the influence of the industry of manufacturers on the wealth of the state, especially when we consider that the cast-iron ornaments are made of native material, and exported in large quantities abroad, and even indeed to America. It is so much the more to be regretted, that, owing to the imitation system which already prevails to a great extent, a branch of native industry, once so flourishing, should threaten to fall gradually into decay. The facility of imitation of the most

saleable objects, by purchasing them at a low price, using them as models, and then casting articles of the same description, enables the imitator to offer his goods at such a low price, that the industrious original manufacturer, who has been at the expense of much time and capital in the designing and forming a brass model, finds it impossible to enter into competition with him. On the one hand, therefore, the manufacturer cannot venture to expend much capital on new models which do not repay the outlay, and, on the other, by repeated casting, the articles lose much of their sharpness and beauty, and the natural consequence, (and which is already perceptible) is, that their reputation abroad must sink; and, notwithstanding their moderate prices, the sale must decline. On this account some of the best manufacturers have given up the business, and the task of improving and perfecting this branch of industry, now rests in the hands of a few.

The piracy of locks is regarded as dishonourable, and against the laws; in technical manufactures new discoveries and improvements can be secured by patents; the cast-iron manufacture alone is unprotected, and imitation allowed to be carried on openly and freely.*

Rep. Pat. Inv.

¶ *Description of a Safety Stirrup. By* Samuel Jackson, M. D. *of Northumberland, Penn.*

[Communicated in a Letter to the Editor.]

The business of the practical physician is not merely to prevent or cure diseases, but also to obviate all the casualties to which we are liable in the journey of life; hence, though the present paper may not be quite medical, or pertain, very strictly considered, to the pages of your journal, yet inasmuch as it recommends a means of safety to your numerous readers, most of whom are country practitioners and riders on horseback, it will not, by them at least, be thought out of place. Were I to present them with an effectual preventive or cure of hydrophobia, how great would be their exultation; and yet what we are now recommending might have prevented more death and distress, in this neighbourhood at least, than has ever resulted from rabies canina. Not one case of this disease has been known within a radius of fifty miles from this place, and probably not within a much greater distance, for the last half century, while, within this very vicinity, and within a very few years, the most distressing lacerations, and even death, have been the sad consequences of persons being dragged by the stirrup.

It is generally supposed that the spring stirrup, which opens at the

* We may remark here, that many British manufactures, in which patterns of various kinds are employed, require the protection of the British Legislature as greatly as the cast-iron ornaments of Berlin are stated to need that of the Prussian Government. If we remember right, the manufacture of brass ornaments of every description at Birmingham, may be cited as an example, to which we believe calico-printing may be added.—A. T.

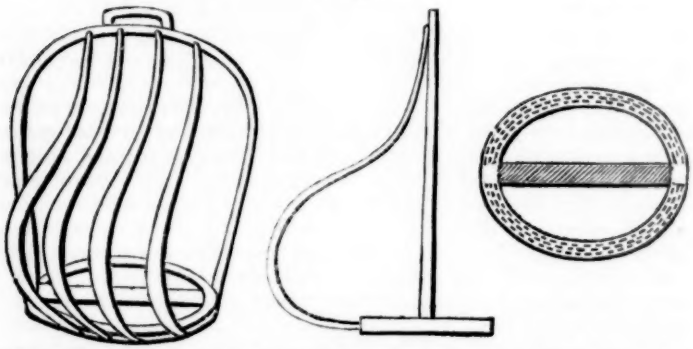
side, affords safety in these cases, and there is an extract from one of my letters in the Medical Recorder, Vol. XI. p. 203, in which it is highly recommended as securing the exit of the foot, let the rider fall in whatever way it is possible. But we have since learned from the actual experiment of falling and hanging by the stirrup, *in propria persona*, that our opinion, so confidently advanced, is utterly erroneous.

After using the stirrup for many years with the most comfortable assurances of safety, I was at last thrown, and my foot was held fast by it, while my head and shoulders rested on the ground. In this dreadful situation, my horse, though young and high-spirited, stood quiet by my side, while with infinite labour and pain, I extricated my foot. I was then told that the rust of the hinge was the cause of its refusing to open, but this was a great error, as was proved by the following decisive experiment.

The hinge was well greased, and made to work with very slight force; I then extended myself on the carpet with my foot in the stirrup, and giving the leather to my servant, I found it absolutely impossible to open it with my foot. The operations were varied in every way in which it was thought possible for a man to fall from his horse, and with the same result. The foot turns quickly round in falling, and hangs by the foot-piece of the stirrup.

I mentioned these things to my talented friend, Mr. Henry W. Snyder, of Selinsgrove, son of the late Governor of Pennsylvania, and he quickly made me a pattern of a stirrup, which I have since procured to be made by George Taber, of Philadelphia. It can be easily understood from the plate. Fig. 1, the entire stirrup. Fig. 2, a side view. Fig. 3, the foot-piece.

Fig. 1. *Fig.* 2. *Fig.* 3.



For an adult, three of the upright or safety irons are sufficient, but as the stirrup may be used by very young persons with small feet, they ought to be very close, and five would be required. These safety bars may be an inch broad. In order to afford him foot-hold, the foot-piece ought to be broad, and the opening in it guarded by a bar in the transverse diameter, as seen in the plate.

We cannot recommend this as a very handsome part of a horseman's caparison, but it is certainly not very unsightly; and until something better be invented, we beg leave to obtrude it upon the attention of all who would ride without fear of the deplorable consequences of being dragged by the common stirrup. Nearly all the evils attendant on human life are the immediate or remote consequences of neglecting either the moral or physical laws, by which our safety is ensured; and if any one reads this paper without availing himself of this cheap and easily procurable prophylactic, let us refer him for further instruction to one of the best books that ever saw the light—Combe "On the Constitution of Man." "We ought," says this author, "to trace the evil back to its cause, which will uniformly resolve itself into infringement of a natural or moral law; and then endeavour to discover whether this infringement could or could not have been prevented by a due exercise of the physical and mental powers bestowed by the Creator on man."

[*American Journ. of the Med. Sciences, Nov.* 1833.

¶ *On Sugar Refining, in France.*

As it is universally known that sirops are injured and decomposed by being too long exposed to an intense heat, various means have been tried to avoid the loss thereby incurred.

The methods which have met with most approbation, are, 1°, the system of evaporating by steam; 2°, the system of evaporating *in vacuo*. Both are decided improvements on the process of evaporating on the naked fire.

But through the agency of steam, the sirops can be granulated only when raised to the temperature of 237° to 240° Fahr., and when heated to that pitch, a material portion of the sirop is still decomposed.

The granulating *in vacuo* is attended with inconveniences of another kind. That system requires a great supply of water, expensive and complicated machinery, very liable to get out of order; besides, the operation takes place in closed and air-tight vessels, and the refiner cannot keep his eye upon it to direct it properly.

Some refiners have tried the use of atmospheric air to facilitate evaporation, but they have been obliged to renounce a scheme which they could not realize.

The art of sugar refining was, then, very far from perfection in France, when an invention, ingenious in its application, great in its results, and remarkable by a success which daily increases, produced a complete revolution in that branch of industry.

A refiner of Lisle, Mr. Brame Chevalier, struck with the idea of using simultaneously steam for raising the sirop to the proper degree of heat, and air, heated by the same steam, to maintain the sirop in a continual agitation, conceived the possibility of obtaining by this means a very rapid, and extensive evaporation, at a very low temperature, thereby preserving the sirop from decomposition, and pro-

curing a great economy of fuel and labour, and also greater returns in sugar.

This very ingenious theory has been most successfully realized. Nothing can be more perfect nor better contrived than the apparatus by which these results have been obtained.

A generator supplies the steam required to work a pump, which drives the air into a cylinder: there the steam heats the air to a proper degree: the heated air is then driven under the false bottom of a boiling pan, heated itself by steam, and escapes by small apertures through the sirop, which it causes to boil immediately. The surplus of steam and heated air is used for warming the stove and store rooms, so that every operation of sugar refining, even that of clarifying, may be made with one boiler and one machine, without the slightest danger of fire.

The boiling takes place in an instant, and as soon as the hot-air cock is opened. Evaporation takes place at 134° Fahr.; granulation is effected in eight minutes, between 178° and 196° Fahr.

Martinique sugars of the fourth quality, worked in this machine, do not produce more than six per cent. treacle, and fourteen per cent. of pale brown sugar, called in France *Vergeoise.*

But great and important as this system is for sugar refiners, it is still more beneficial to sugar manufacturers, who extract the sugar from the beet root or the cane. It is easily conceived, as the saccharine juices, which do not weigh more than *ten* degrees, must be exposed much longer to the fire than the sirops proceeding from the melted sugar, which weigh generally thirty degrees. Moreover, by blowing hot air through the juices, they are purified of any unpleasant taste they may have acquired.

Finally, the advantages which account for the decided preference obtained by the system of Mr. Brame Chevalier, consist in its procuring more and finer sugar from the same quantity of raw materials of the same sort, and, moreover, in manufacturing, with greater rapidity, a superior sort of sugar.

These are positive facts, which are daily proved and verified by the great number of visiters who call at Mr. Brame Chevalier's sugar refinery at Lisle.

[*Lond. Journ.*

Dr. Church's Steam Carriage.

This long projected invention has at length arrived at something like maturity. The carriage, which is fitted up with considerable taste and elegance, was launched for the first time on the public road on the evening of Friday, the 25th ult. Its machinery had never, before that evening, in a connected form, been actuated by the power of steam; and its performance was such as to produce a more promising expectation of realizing the problem of steam propulsion on ordinary roads, than any other effort of the sort that we have heretofore seen.

Our present limits will not allow us to give a detailed account of the machine, but we shall endeavour to do so in our next, accompanied with the specification of the last improvements, which have been adopted in the construction of the boiler, and which have tended very materially to the accomplishment of a perfectly safe and effective locomotive machine.

The boilers, engines, and their appendages, are all enclosed within a square compartment of about eight feet high and long, and five feet wide, which forms the central part before and behind, to which are attached capacious coach bodies, corresponding in appearance, and capable of holding ten persons in each; and connected to these are open cabriolets affording accommodation for eight persons more, making twenty-eight inside passengers. Below are receptacles for luggage, and on the roof accommodation for thirty persons, exclusive of the conductor and guard.

Little is to be expected from a first attempt, but we have much pleasure in saying that a more successful result could not have been anticipated.

After passing heavily laden from the manufactory at Bordesley Green, near Birmingham, through several green lanes recently laid with loose gravel, and performing several acute and difficult turns in the road, this ponderous vehicle proceeded along the Coventry Road with at least fifty persons upon it, at a rate of more than twenty miles per hour for some distance, (perhaps near a mile;) but as it was not designed to carry this experiment further than a mere trial of the capabilities of the machinery, and the means for prolonging the journey not having been provided, we are not in a situation to state such particulars at present as would, perhaps, be necessary to satisfy the inquiries of a practical engineer; but hope to be enabled in our next to give a more detailed account of the performance and construction of the machine, which certainly comprehends several features of considerable novelty and ingenuity, and unquestionably reflects very great credit both upon the ability and perseverance of its talented projector. [*Ibid.*

Air Gun.

It is a curious fact, that although the air pump is a modern invention, yet the air gun, which is so nearly allied to it, in the construction of its valves and condensing syringe, should have existed long antecedent to it; for it is recorded that an air gun was made for Henry the Fourth, by Marin of Liseau, in Normandy, as early as 1408, and another was preserved in the armoury at Schmetau, bearing the date of 1474. The air gun of the present day is, however, very different from that which was formerly made, and which discharged but one bullet after a long and tedious process of condensation, while it now discharges five or six without any visible variation of force, and will even act upon a dozen, though with less effect.

CELESTIAL PHENOMENA, FOR NOVEMBER, 1834.

Calculated by S. C. Walker.

Day.	H'r.	Min.	Sec.	
9	5	15		Im. 71 τ^3 Aquarii, 5.6, N177° V144°
9	6	4		Em. 244° 226°
12	12	28		N. App. ☽ and 33 Ceti ☽ south 0′, 3
30	0	59	58	*Im. Sun's first limb 260° 0′ 275° 34′
30	3	37	24	†Em. Sun's second limb 71° 17′ 111° 32′

Meteorological Observations for August, 1834.

Moon. Days.	Thermometer. Sun rise.	2 P.M.	Barometer. Sun rise.	2 P.M.	Wind. Direction.	Force.	Water fallen in rain. Inches.	State of the weather, and Remarks.
⊗ 1	63°	80°	Inches 29.85	Inches 29.85	NW.	Calm.		Clear day.
2	69	82	.85	.90	NE.	do.		Cloudy—lightly cloudy.
3	69	85	.90	.95	W.	do.		Clear—lightly cloudy.
4	67	86	.95	.95	W.	do.		Fog—clear.
5	72	90	.95	.95	W.	do.		Clear day.
6	71	89	.95	.90	W.	do.		Clear day.
7	69	90	.85	.80	W.	do.		Clear day.
8	68	90	.80	.70	W.	do.		Clear day.
9	72	90	.75	.70	W.	do.		Clear day.
10	70	88	.70	.70	W.	do.		Clear day.
11	70	88	.70	.75	W.	do.		Clear day.
12	72	90	.70	.80	W.	do.		Clear day—rain in night.
13	72	90	.75	.85	W.	do.		Cloudy—clear—rain in night.
14	76	89	.80	.85	W.	do.	0.50	Cloudy—clear—shower.
15	69	90	.85	.85	W.	do.	0.03	Clear day.
16	70	90	.85	.90	NW.	do.	0.04	Cloudy—lightly cloudy.
17	62	70	.90	.90	NW.	Brisk.		Clear day.
18	64	76	30.00	30.00	W.	do.		Clear—lightly cloudy.
19	69	84	29.90	29.75	W.	do.		Cloudy—clear.
20	69	84	.90	.90	W.	do.		Clear—flying clouds.
21	69	86	.90	.90	W.	Moderate.		Clear day.
22	69	81	.85	.85	E.	do.		Clear—flying clouds.
23	62	82	.85	.85	W.	do.		Clear day.
24	62	82	.85	.85	W.	do.		Clear day.
25	64	84	.85	.85	W.	do.		Clear day.
26	67	86	.90	.90	NW.	do.		Clear day—rain in night—thun-
27	68	86	.90	.90	W.	do.	0.04	der & lightning
28	74	90	.80	.80	NE.	do.		Cloudy—flying clouds.
29	72	90	.80	.80	NE.	do.		Clear day
30	74	90	30.00	30.00	W.	do.		Cloudy—clear.
31	72	90	.05	.05	NE.	do.		Cloudy—clear.
Mean	69.93	82.03	29.85	29.85	NE.	do.	.91	Cloudy—lightly cloudy

Thermometer.			Barometer.
Maximum height during the month,	90. on 5th,	7, 8, 12 13.	30.05 on 29th & 30th.
Minimum do.	52. on 28th.		29.65 on 15th.
Mean do.	73.48		29.85

* For irradiation and inflexion add 9″.2.
† For irradiation and inflexion subtract 8″.8.